



MAGAZINE



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Margaret Farrell



Arthur Morrell



Peter Schofield

THERE are 1310 local weekly newspapers in Britain. "Local rags" we sometimes call them, indicating by the epithet a faint air of condescension towards publications that are avowedly parochial in nature. Perhaps we feel that the tempo of events is too fast for these cumbrous papers whose columns are filled with the minutiae of social change and converse. Or is the description one that indicates our affection for our local papers? Would we miss them if they did not appear?

Radio and television today shower us with news of the world's monster mistakes and tragedies, and the dailies batter us with their biased headlines. The traditional hunger for information is met with a megaton menu, and it's all a bit too much for us.

Where do the local weeklies fit in? How can they hope to survive when the average mortal is already awash in national, technical, political and intellectual news? The answer is that the weeklies are the only papers that satisfy thoroughly that perennial curiosity latent in the most urbane citizen—to know what his immediate neighbour is doing. However nourishing the daily paper diet of Macmillan, Macleod, Ted Hill and Lord Snowdon, we still have an appetite for news of the particular local community in which we live.

Other Peoples' Doings

Other people, their doings and misdoings, are the mirrors in which we see our own lives. The trials and temptations, the drunks and disasters, the wanderings and the wins on the pools in which our neighbours are caught up—all these are of personal interest to us. We would be less than human if we did not want information about them.

The *Kidderminster Shuttle*, the *Smethwick Telephone*, the *Southport Visitor*, the *Camborne-Redruth Packet*, the *John*

O'Groat Journal, the *Cornishman*, the *Sligo Independent and West of Ireland Telegraph*, the *St. Neots Advertiser*, *Hunts, Beds, and Cambs News*—these and more than a thousand others all supply our need for local intelligence.

Encyclopaedic Chronicle

The weeklies don't miss a thing—it's their job not to. They are serial encyclopaedic chronicles of local events that impinge on all our lives. Not an accident, nor a fire, neither weddings nor funerals, nor crashes nor commemorations, slanders, séances nor symphonies escape through the mesh of the weekly editor's net. They may be minutiae, but there is not one item that lacks human interest, and this is the root of the weeklies' being and the reason for their continued demand. "Names," as the weekly editor will observe gently as he scans the list of the allotment society winners, "names make news."

Not only do the weeklies chronicle our affairs from end to end of our lives, they carry tidings of those events which occur in the valleys of our youth to the remoter corners of the globe. There are few ex-Servicemen who will not remember with gratitude reading items of news about their home town or village conveyed to them in tattered copies of their "local rag" that found their way to the most unlikely corners of Europe and Asia in the last war. Absence indeed makes the heart grow fonder, and there were times when in recalling the grimy outlines of a smoke-blackened industrial city you felt that you were gazing down the avenues of paradise. The "local rag" brought you the very sight and sounds, the atmospheres and the flavour of home. It still does, of course. The only difference now is that most of us actually live where our homes are.

The weeklies are today among the most

prosperous sections of the British Press. Their total circulation has increased steadily. In 1958 a Newspaper Society poll indicated that the total circulation of weeklies in England and Wales was 9,700,000. A survey just completed puts the figure at 10,200,000. There is no hard and fast rule for obtaining readership figures from circulation, but it is customary to multiply the circulation figure by 2.6 on the basis that there are 3.1 people, including children, to a household throughout England. This gives us an approximate readership for the weeklies of over 26,000,000. Prosperity is reflected in the advertising figures. In the first nine months of 1961 local weeklies in England and Wales carried as much national advertising (not local or classified) as in the whole of 1957.

My Start in Journalism

The weekly newspaper on which I started my journalistic career rewarded me with a ludicrous pittance, a measure of experience, and a respect for the rôle of the weekly paper in the local community. In the tiny sanctum which was the editorial office—inscrutable and (I thought) implacable—sat the bespectacled, editorial spider himself. "And don't forget," he called some time later as I left, after he had painted for me a picture of gargantuan tasks ahead, "don't forget that you do your work first and eat after. The last lad got the sack because he went off to tea in the middle of an assignment!"

In the main, the local weeklies do their job well in the best tradition of accurate reporting. They may not always be as concise as their national brothers, but they do have the merit of not editing the sense out quite so often.

Readers are invited to submit contributions to this column.

THE HIDDEN HAND OF CHLORINE

Most people associate chlorine with an astringent smell in swimming pools and an astringent taste in purified water. But there is more to chlorine than this. Increasingly in demand, it is a vital intermediate for many sophisticated chemicals that play a large part in modern life—such as keeping cars from damage in a freeze-up, as symbolised on our front cover.

Contributed by General Chemicals Division



THE General Chemicals Division of ICI is the largest chlorine producer in Europe and one of the largest in the world outside the USA. Their installations, incorporating the results of over sixty years of experience, are technically second to none in the world, and the power stations that serve the ICI plants are among the largest and most up to date in the country. The Weston Point station alone—the largest privately owned in Britain—could light and heat a city.

It was in 1897 that the Castner-Kellner Alkali Company, later to find its way into ICI in the 1926 merger, first began making electrolytic chlorine. In terms of chemical development, 65 years is an exceedingly long time. Yet it goes from strength to strength and is today more in demand than ever. Why should that be so?

First of all, what is chlorine? It is a gas which becomes a liquid only under pressure or by refrigeration. It spends its life behind the walls of a container, but there are still many alive who remember it as the greenish-yellow choking mist that came creeping across no-man's-land to the trenches in Flanders.

A Chemical Shoehorn

Now, chlorine is not much use to anybody as chlorine, but as a chemical that will change other chemicals—it has been described as a chemical shoehorn—it plays a big role in the sophisticated world of today. Chlorine is highly reactive. At moderate temperatures, and often without the help of a catalyst, it will replace the hydrogen atoms that are linked to carbon atoms in the chemicals called hydrocarbons. If you chlorinate methane (consisting of one atom of carbon and four of hydrogen), this is what happens:

Replacing 1 hydrogen atom gives methyl chloride (refrigerant, and one of the main raw materials for silicones).

Replacing 2 hydrogen atoms gives methylene chloride (powerful solvent, widely used as a paint-stripper).

Replacing 3 hydrogen atoms gives chloroform (anaesthetic, solvent).

Replacing all 4 hydrogen atoms gives carbon tetrachloride (solvent and fire extinguisher).

Chlorinated chemicals have a very wide range of physical and chemical properties, and they play a part in the manufacture of almost everything you see around you. Your fountain-pen clip was degreased with one chlorinated solvent before being plated, and rapid-dried with another after being plated. Yet another is used to dry-clean your clothes. Chlorinated wax probably went into the lino on the floor, and other chlorine derivatives into your plastic mackintosh, your toothpaste, and the anti-knock additive

that's used in the petrol in your car or motor bike. The list is almost endless. No wonder Lord Cherwell said (in the process of taking an elegant side-swipe at classical scholars) "It's more important to be acquainted with the properties of chlorine than with the improprieties of Claudius!"

Steep Rise in Demand

All this goes to explain why the world's production of chlorine is growing so fast. The production of some basic chemicals—such as sulphuric acid or soda ash—grows in direct proportion to industrial production generally. So it was once with chlorine. But now the production of chlorine in Britain, the USA and other industrialised nations has far outpaced the growth rate of the gross national product, showing that this chemical—once an embarrassing by-product of alkali manufacture—has assumed in modern times an importance of its own. The two curves on a graph representing the growth of chlorine production and national production in Britain began to diverge in 1952. Since then chlorine production has forged steadily ahead, and at the present time is still rising steeply.

In the USA consumption per head is higher than in Britain. This is partly explained by the fact that, because of different natural and social conditions, the Americans use more chlorine than we do for production of automobile anti-freeze, paper pulp bleaching and water purification. But despite this qualification, American experience does point to even greater increase in demand for chlorine in Britain. The gathering momentum of what has been called the Second Chemical Revolution calls for more and more chlorine as a constituent of the sophisticated new chemical products that sell well wherever living standards are rising. In particular, the petrochemicals industry is making available a bigger quantity and a wider variety of organic chemicals than we have ever known before. Many of these can be chlorinated, and so become grist to the chlorine chemist's mill.

Electricity and common salt are the basis of chlorine production—which explains why the big producers like to be near saltfields and coalfields, as ICI is in the north-west and north-east of England. It was Faraday who discovered that if you pass an electric current through a solution of salt you split it into its components, sodium and chlorine, the sodium combining with the water in the brine to form caustic soda. Faraday showed that the current that liberates 23 parts of sodium simultaneously liberates 35.5 parts by



weight of chlorine. This means that for every ton of chlorine produced on an industrial scale you will produce 0.7 tons of sodium, which in fact usually appears as 1.22 tons of caustic soda.

This ratio has loomed large ever since industrial brine electrolysis (as the process is called) began in the 1890's. At that time the point of electrolyzing brine was not to make chlorine, but caustic soda for the soap industry, and later for the rayon industry.

Nineteenth-century Challenge

Utilising Faraday's laws in industrial practice was quite a challenge for chemists, and during the last decade of the nineteenth century men like Le Sueur in America, Carl Kellner in Austria and Hamilton Y. Castner, Hargreaves and Bird in England were busy solving the practical problems involved. There were two main ones: first, to prevent the chlorine and caustic soda from reacting with each other as they were produced; and secondly, to make the most efficient use of the massive electricity needed.

Among the scores of patents filed in those years relating to the apparatus for electrolysis of brine there were really only two basic designs—diaphragm cells and mercury cells—and to this day these two kinds of electrolytic cell, with many refinements, supply most of the world's chlorine. The larger part of the output at General Chemicals Division's seven electrolytic plants comes from mercury cells, of which the original type, invented by Castner and Kellner, were operated by the Castner-Kellner Alkali Company.

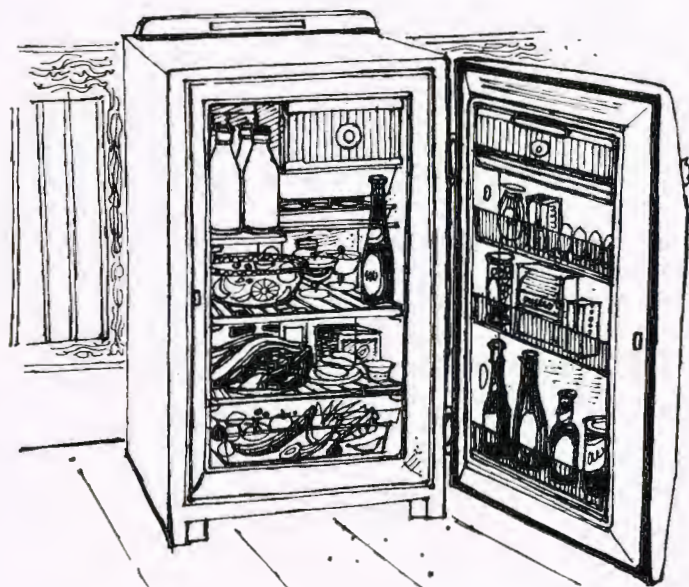
The Modern Cell

Modern mercury cells are long, very slightly inclined troughs, down which the brine flows under a series of graphite blocks. Flowing along the bottom of the trough in the same direction as the brine is a stream of mercury. An electric current passes continuously between the mercury and the graphite blocks, with the result that chlorine gas leaves at the upper surface of the brine and sodium is liberated at the mercury surface. The chlorine is piped off at the top of the cell, and the sodium dissolves in the mercury before it can react with the water. At a later stage the sodium is removed from the mercury by means of water, which converts it to caustic soda, the mercury freed of its sodium content then being recirculated through the cell.

Each mercury cell is several feet wide and fifty or more feet in length, and can produce between 300 and 400 tons of chlorine a year. So you can imagine the considerable acreage a major chlorine producer must devote to accommodating his cells. Space costs money, and the manufacturer who makes maximum use of his space puts himself in a

The cell room where chlorine is made. The mercury cells are long, very slightly inclined troughs, down which the brine flows under a series of graphite blocks. Flowing along the bottom of the trough in the same direction as the brine is a stream of mercury. An electric current passes continuously between the mercury and the graphite blocks, releasing chlorine at the upper surface of the brine and sodium at the mercury surface

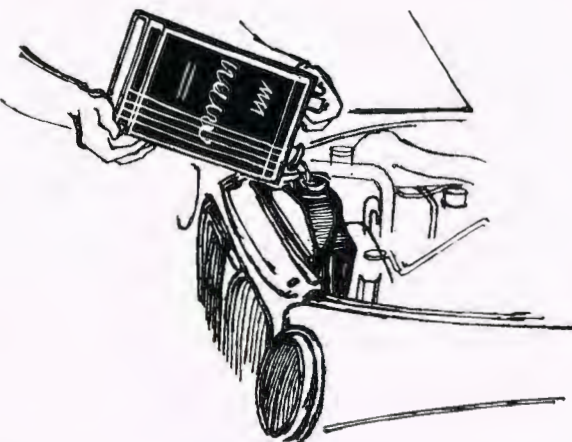
The Nineteenth-century chemical with the Twentieth-century look



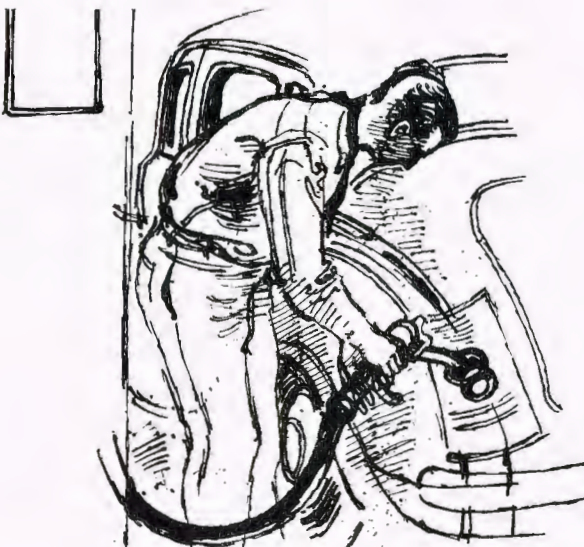
Refrigerators. One of the commonest uses of chlorine in the home is as a constituent of the non-toxic, non-inflammable 'Arcton' refrigerants. This combination of chlorine and fluorine with carbon is widely used for this purpose



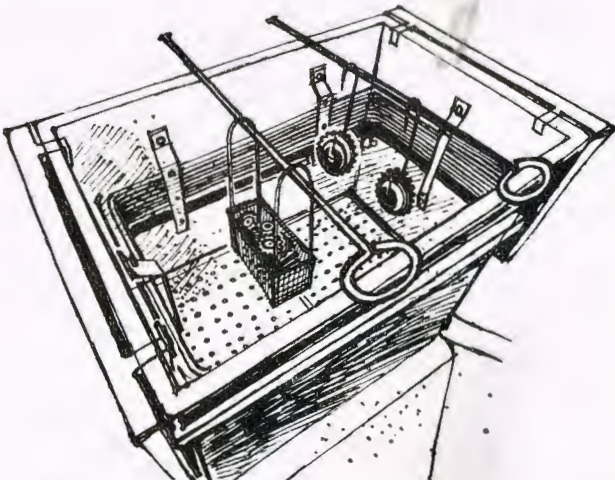
Aerosol propellents. In press-button sprays, 'Arcton' gas, an inert and harmless combination of chlorine, fluorine and carbon, is packed in liquid form under pressure in a container. When the pressure in the container is eased by pushing a button valve, the liquid instantly evaporates and shoots out as a stream of vapour, carrying with it hair lacquer, de-icing solutions, toothpaste or whatever it is



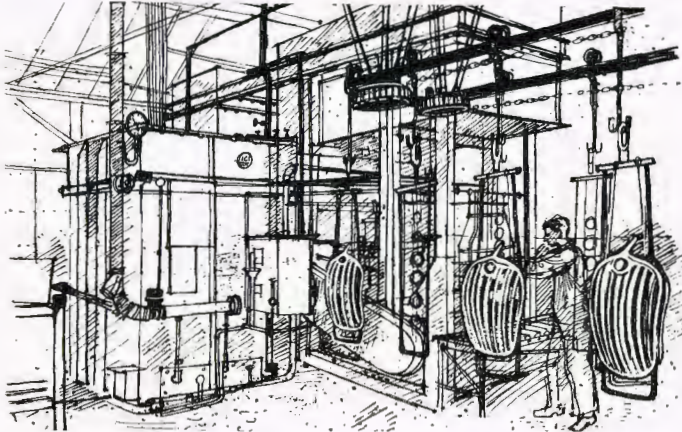
Anti-freeze. Chlorine is one of the starting materials used for the intermediate from which ethylene glycol anti-freeze is made, but is not present in the final product



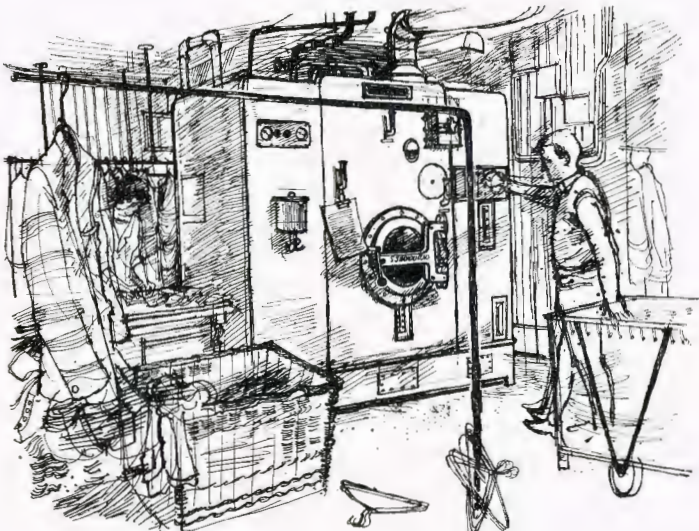
Anti-knock. One of the chemicals which gives modern petrol its superior performance is tetraethyl lead. Although chlorine again does not appear in the finished product, more chlorine goes into the intermediate manufacture of anti-pinking and anti-freeze compounds than into any other single group of chemicals except solvents and plastics



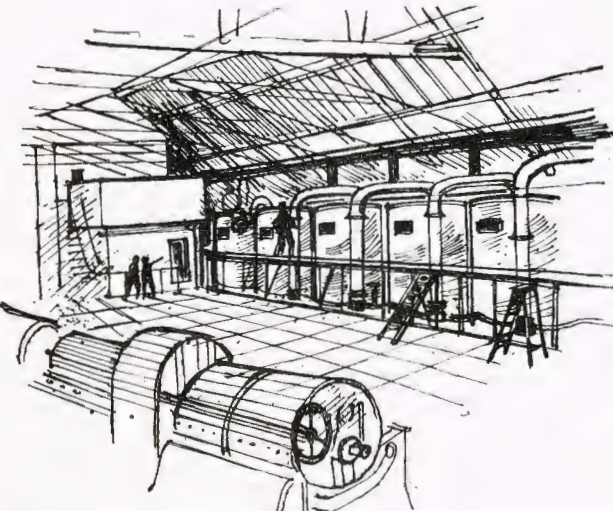
Metal degreasing. Many metal articles require degreasing in the course of manufacture. Trichloroethylene, a chlorine-containing product, one of the most powerful non-inflammable grease solvents known, is used for this purpose in specially designed plants



Large-scale degreasing. In the course of the manufacture of motor-car components, to quote a prime example, degreasing needs to be done on a large scale. In this drawing the assembly line of Jaguar radiators has just passed through the degreasing plant



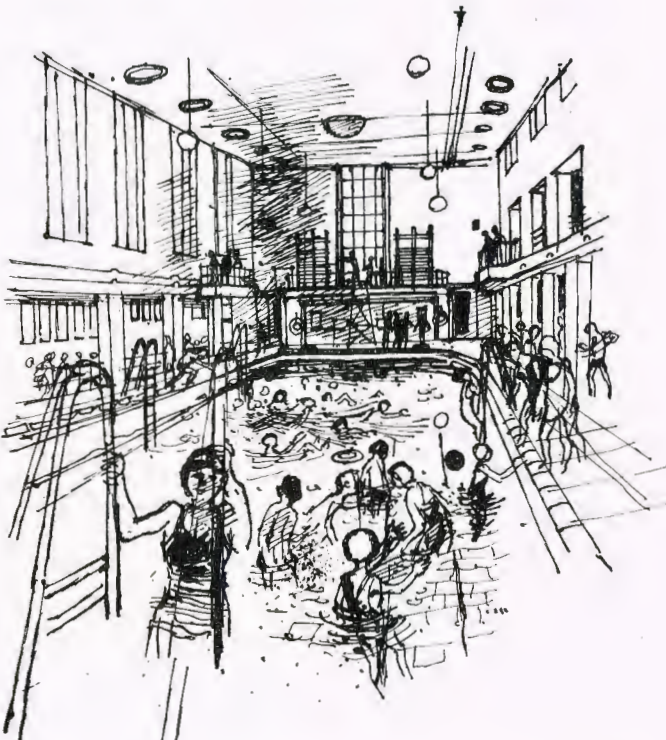
Dry-cleaning. Most dry-cleaning is done nowadays with the chlorinated solvent perchloroethylene—non-inflammable, highly effective and economical



Paper bleaching. Liquefied chlorine gas and chlorine-derived chemicals such as sodium and calcium hypochlorite are used to bleach the pulp from which paper is made. The chlorine changes place with the hydrogen of the water, thus liberating oxygen, which reacts with the colouring matter in the pulp and renders it colourless

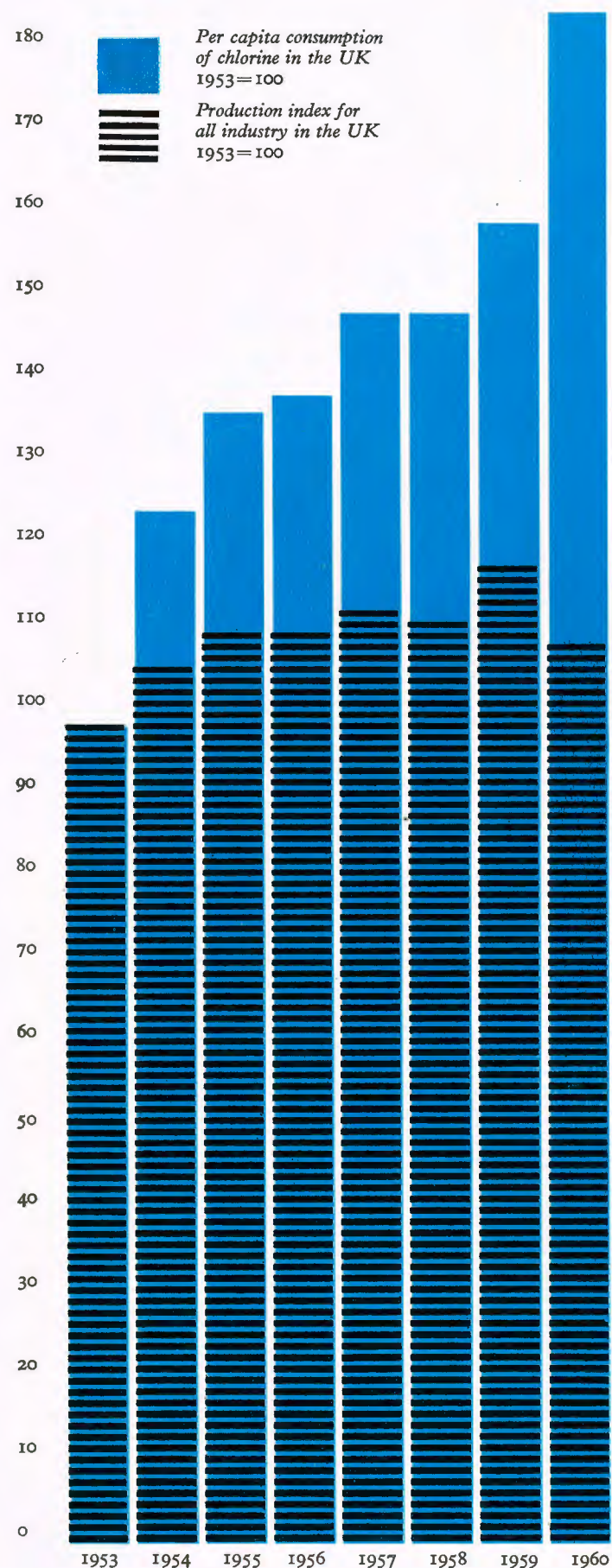


Plastics. Chlorine is used in the manufacture of the vinyl chloride that ICI Plastics Division later converts into polyvinyl chloride, one of the most important and versatile plastics. PVC is used in hundreds of ways from water-proof clothing to cable insulation



Water purification. The easiest and cheapest way to disinfect swimming pools or drinking water is to treat it with just the right amount of chlorine

Rising demand for chlorine. This graph shows how consumption of chlorine in Britain per head of population since 1953 has grown faster than industry in general



favourable position. And there is plenty more scope for ingenuity—in the design of the electrical side of the installation, for instance. The less electrical current that is wasted, the cheaper the chlorine, because the amount of electricity used (usually about 3250–3500 kWh per ton of chlorine, equivalent to nearly two tons of coal) is a major factor in the cost of the process.

Where does ICI's chlorine go? A very large proportion stays inside the Division for use in the production of other chemicals. The most important of these are the chlorinated solvents used by the engineering industries to degrease and dry metals, and by dry-cleaners to clean clothes. Two of these chemicals are outstanding—trichloroethylene for degreasing and perchloroethylene for dry-cleaning. The demand for both has grown rapidly. In 1908, for example, trichloroethylene was made at the rate of only a few tons a year, and most of this was used in the making of such things as printing inks and boot polish. Today ICI makes it in tens of thousands of tons and, through its Technical Service Department, advises consumers in many industries.

Large Tonnage for Plastics

The next most important outlet for chlorine is in the plastics industry. Plastics account for a very large tonnage, and General Chemicals Division has its own plants for making—from chlorine and acetylene—the vinyl chloride that ICI Plastics Division later polymerises to give polyvinyl chloride, one of the most versatile plastics, used for everything from raincoats to cable insulation.

Other plants inside General Chemicals Division use chlorine to make 'Arcton' refrigerants and aerosol propellants, which are *chlorofluorohydrocarbons*; pest-control products for distribution by Plant Protection Ltd.; chlorinated rubber for special paints; chlorinated waxes, which are used principally in plastics manufacture to keep plastics supple; and bleaching products for textiles and paper.

How we Compare

ICI also exports chlorine—sometimes directly but more generally as a component of other exports. With the Common Market looming larger, it is natural to wonder how we compare with Continental producers. None of them has a clear-cut advantage in chlorine costs. On the whole, those which have the advantage of cheaper electricity (from water power) are at a disadvantage when it comes to salt, which may have to be brought from a great distance; or, if they are near sources of power and salt, they may not be well placed to transport their products to export markets. General Chemicals Division, close to virtually inexhaustible supplies of salt and with the great port of Liverpool on its doorstep, has good grounds for confidence.

How statistics digested by a computer are used to plan better chlorine production is described in an article entitled "Statisticians to the Fore" on page 54.

IN THE GARDEN FEBRUARY

This month we see the beginning of spring, and how very welcome it will be. With the coming of spring the gardener's task is a busy one; with the better weather and longer days there are a hundred and one various jobs staring us in the face.

Look to your Mower

The grass will be the first to show real signs of growth, and that means the lawnmower must be in good order. It must be sharp, properly adjusted for a clean, easy cut, and well oiled in readiness. Before we begin the mowing, the lawn will be the better for raking with a wire spring rake and sweeping with either a besom or a hard brush to scatter the worm casts. If these are left for the mower to pass over them, the surface of the lawn will be uneven and patchy. To adjust the mower to cut at about an inch above the ground is low enough for the first mowing; the bottom blade can be gradually lowered for subsequent mowings until the grass is being cut at about half an inch. There will be no need to cut the grass closer than this, in fact, to do so can do more harm than good.

Pruning of Shrubs

With a few nice days, growth soon begins on the shrubs and roses, and that means pruning must be attended to. The shrubs to prune during the next month are those which flower on the current season's growth and include the well-known buddleia, *Caryopteris clandonensis*, the late summer flowering blue sage-like shrub *Hydrangea paniculata*, hardy fuchsias, and those shrubs such as the cornus or dogwoods and willows which are grown chiefly for the winter colour of the twigs.

Most of these are the better for drastic pruning. The buddleia, for instance, can have all last year's branches

Winter Pruning of Shrubs, by Percy Thrower

cut back to three or four buds from where the growth commenced; in the case of young shrubs this may mean cutting back to within six or nine inches from the soil. The caryopteris can be treated in a similar way, and the young growths will be sturdy and bear large spikes of flowers. But *Hydrangea paniculata* must not be confused with *Hydrangea hortensia*, sometimes called the pot hydrangea. To prune this one would mean cutting away the flower buds. All last year's growth on *paniculata* can be pruned back to a bud three or four inches from the older wood, and the resulting growths will produce large creamy-white heads of flowers from July onwards. These will take on a pinkish tinge as they age. All last year's growth on the hardy fuchsias will have been killed down to ground level by the

frost, and these will be the better for cutting down to the soil. The new growth will come from below the soil and will flower from July onwards.

Cutting back Roses

The cornus or dogwoods and red and yellow twiggled willows can be pruned in a similar way to the buddleia and caryopteris. Apart from the hardy fuchsia tops so often being killed by the frost, some other shrubs suffer as well. The top growth of both *Phlomis fruticosa*, the Jerusalem sage, and *Senecio greyi* may be damaged, and the branches can be cut back to where new growths are beginning to grow. If you have not these beautiful summer flowering shrubs in your garden there is still time to plant, and yet another four or five weeks to plant roses. Both the established roses and the more recently planted will need their annual pruning.

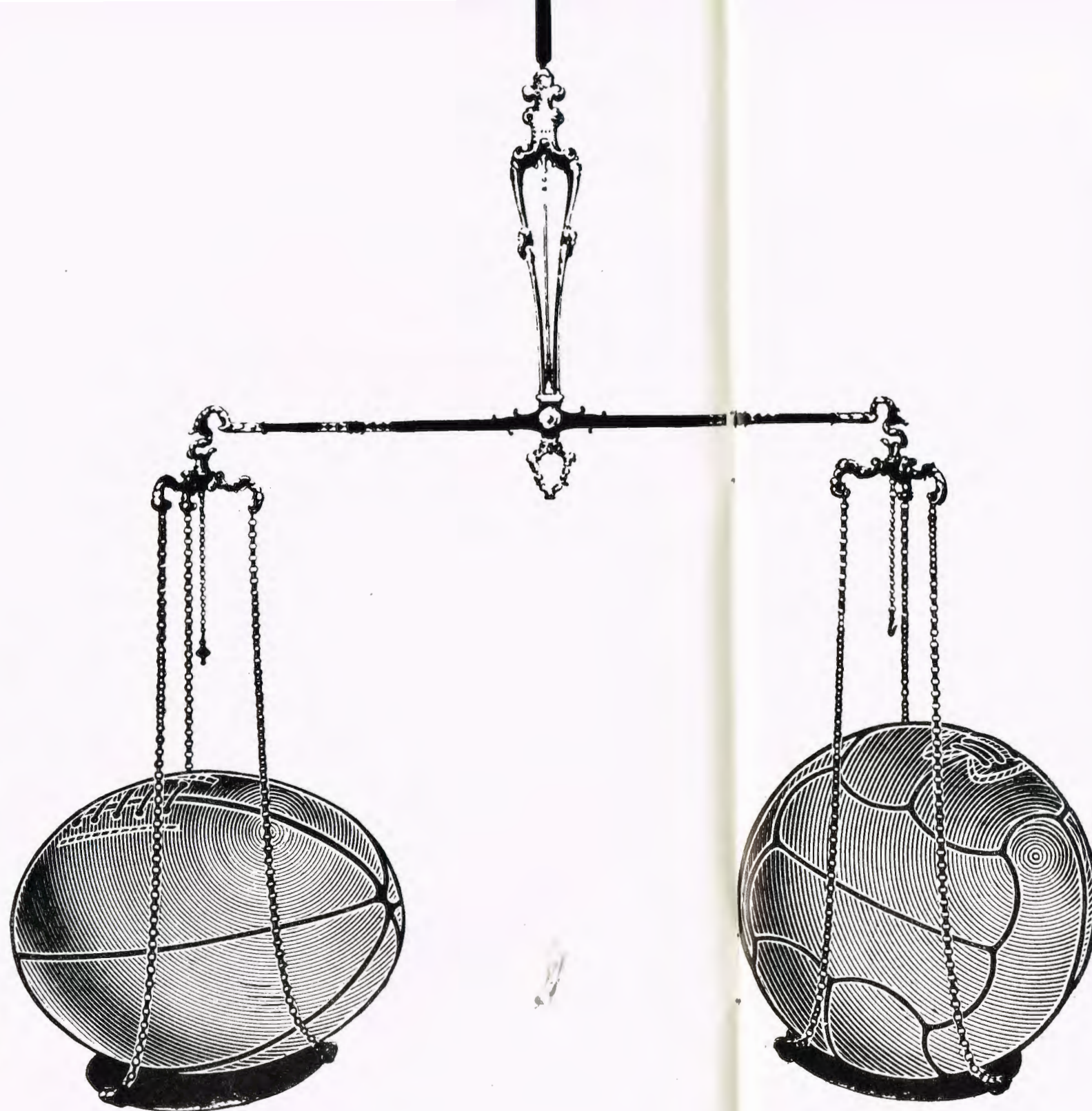
On both the hybrid tea roses and the floribunda the last year's branches which produced the flowers can be cut back—in the case of the strongest or thickest, nine to twelve inches from where the growth commenced, and the thinner or weaker ones four to six inches. Where possible some of the older wood on the aged rose bushes can be cut out completely if there are younger branches below. After pruning is the most convenient time to top dress and clean up the beds. An all-purpose organic-based fertilizer can be sprinkled on the surface of the soil and be lightly forked in. Manure or peat can be worked into the surface soil too. The soil in most town gardens is lacking in humus, and as manure is a scarce commodity these days horticultural peat is a good substitute. This can be spread over the surface an inch to an inch and a half thick. As black spot was so bad last year I would recommend spraying the roses after pruning with ICI's 'Tulisan.'



The author pruning his roses

WHEN WILL RUGGER TIP THE BALANCE ?

By Denzil Batchelor



If I have my guess, before Chelsea again figures in the top half of the First Division, Rugby will have superseded Association Football as our national sport—and also become the world's favourite winter game.

It is on its merits as a game as well as on the immense increase in its popularity in the post-war period that Rugby could embark on a five-year plan to displace soccer in the nation's affections. Once again, it won't attempt to do anything of the sort. "National game?" murmured Colonel Prentice, secretary of the Rugby Union, lunching with me recently. "No, no—certainly not. I don't think any of us have such aspirations for Rugby. We like the game as it is, with its present status."

Well, there is a pronunciamiento from the top. And yet my belief is that in spite of Colonel Prentice and the wise and balanced committee of the Rugby Union, the game cannot (within the next twenty years) fail to become still more popular.

Soccer Slumps

Consider the portents. In the Christmas soccer matches this season attendances slumped alarmingly and significantly. Average gates at League matches were 13,507 as compared with 18,096 last year and 22,008 in 1952. Probably, over the whole season, attendances at League matches this year will be some six million fewer than they were when the game was at the peak of its popularity a dozen years ago. Many reasons (or excuses) are given for this. First there is the increase in family motoring: there are more than twice as many cars on the road as there were ten years back. Then there are the charms of the Grandstand TV programmes: there are more than five times as many holders of TV licences as there were in 1952.

But the fact remains that fewer and fewer people are watching Soccer and more and more people are watching and playing Rugby. Since Colonel Prentice became the Union's Secretary in 1947, the number of clubs under his jurisdiction has risen from 830 to 1600. Moreover clubs have increased their playing strength: way back in 1947 Wasps put two or three teams into the field on Saturday afternoons—today they field fourteen. On an average those 1600 clubs, most of which in the old days were represented by one fifteen, today field three or four. The greatest problem

contemporary Rugby is faced with is to find enough good referees to handle the twenty-five hundred matches that take place every weekend. More schools have turned to Rugby, more industrial clubs and Service units. The old sneer that it's a game exclusively for snobs carries no weight today in the light of the admitted fact that it's the national sport of Wales, and in particular of the Welsh miners.

World's Most Amateur Game

Rugby, next to hockey the most amateur game in the world, is a prosperous sport—and few could claim as much for League football. Its wealth comes from one main source: the profits made from international matches at Twickenham. Those of us who pay £1 for any seat in the stands have helped to build up so formidable a reserve that the Union has been able to lend clubs £440,000 at 2% to buy grounds or improve facilities. Last year alone £51,855 was advanced on loan. Clubs reap other benefits for their guinea-a-year subscription to the Union, including free films and coaching. Players are covered by insurance, with benefits of up to £5000, for the £1 per team paid by the club, of which the Union makes itself responsible for 5s. All this comes out of Twickenham, which today can hold a 73,000 crowd and which is soon to enlarge its capacity in the matter of ringside seats, and may—I warn you—increase its prices. Of course, apart from being hell on earth to drive home from, even Twickenham isn't big enough, and in London and throughout the country there are not enough grounds to give Rugby the place in the winter sun it deserves. There is, however, the money to be made available to buy grounds when the chances arise.

But, except on the top level, the finance of Rugby has an inspired amateurishness that is beautifully English. Ninety-seven per cent of clubs charge no gate at all: they rely on the bar takings to keep them out of the red. If capital is needed they are apt to show the astounding resourcefulness of the innocent to rustle it up from somewhere: one club last season made a wastepaper drive among its supporters and sold the proceeds to pulp merchants for a cool £1000.

It is perhaps the *amateurishness* of Rugby that is particularly charming in a world dedicated to a commercialism



Col. F. D. Prentice, secretary of the Rugby Union

which has infected most sports to the very marrow of their bones. The 25,000 amateur soccer clubs under the control of the Football Association are advised of their referee, linesmen and times of kick-off by Headquarters: Rugby clubs would consider this an unwarrantable interference with their private lives and with the right to manage or mismanage their own affairs in their own way. Why, if you allowed the top brass to boss you about like that, the next thing you knew they would be dictating how many pints were good for you after the match—and every good clubman knows that the beer after No Side is quite as important as the game itself.

And on the touchlines lurk the countries that have taken up Rugby and still wait to be welcomed to Twickenham. Rumania (which almost beat France at her best) with 132 clubs. Italy with 110 clubs. West Germany with 52; Poland with 38; Czechoslovakia with 35; Spain with 26; East Germany with 17; Morocco with 11, and Portugal with 9. There are also Holland, Belgium and Sweden—all Rugby-playing countries today. What is going to happen to them? Is Rugby going to become *their* national game—these countries which mostly had never heard of it before the war? Does the future mean that these countries are to be on the other side of an iron curtain dropped by our own International Board? For the present, it means just that.

"The point is," says Colonel Prentice, "that Rugby is fundamentally a *club* game. If you increased the fixture list of

international matches, no club would see its star players more than once or twice a season." Well, Soccer faces the same problem: Johnny Haynes and the other leading players ought at this very time to be becoming welded into a team for our bid in the World Cup rather than wasting their skills on the League programme. The sheer, undisputed amateurism of British Rugby has saved it up to now from having its future blueprinted for it on the lines, for example, of Kramer's professional tennis circus.

But the game's intrinsic charm and merit may lead to the wide world increasingly taking it up; to the Fédération Internationale Rugby Amateur achieving an ever more elevated status till it finally challenges our own International Board, representing only the four home countries, France and the Commonwealth, for world control of the game. The defection from the Commonwealth of South Africa (one of the greatest of Rugby-playing nations) may embarrass our Board still further. To me at least it seems certain that the writing is on the wall: in the not far distant future there will be a World's Championship Rugby Cup—and England, Scotland, Ireland and Wales will want to compete.

I am sure that if I live long enough to witness this development I shall regret its coming. The charm of Rugby's amateurism, the attraction of its loose-linked or even amorphous programme planning, are undeniable indeed. But great sports, alas, in this day and age inevitably turn into great entertainments, and great entertainments cannot help but become big business.

Rugby Knockouts?

Perhaps you may feel that there would be more *point* to the Rugby season if there were a knock-out cup for clubs as there is for counties, but staged on the lines of the FA Cup. This is not regarded as a practical possibility, for the amateur has to put his job before the game and therefore could hardly be ready for the long-drawn-out programme of a cup competition. But I have grounds for thinking that it is likely that a time will come when the major clubs will take part in a Rugby Union League competition. This would be, I think, the most revolutionary change the game has ever known, but it would have the advantage of clearing up the untidiness of our

national Rugby programme and of ensuring that young talent was never overlooked.

This canalisation of Rugby into a League programme will, I predict, be the first change that the game will see before the challenge from FIRA aiming to turn Rugby into an international entertainment, which could only mean that the game and its players would forfeit their amateur status.

With the assent of the International Board, we may look for more changes in the laws designed to make the best of games better—faster, more open, more exciting to player and spectator alike. I am afraid one of these changes is unlikely to be the first I should advocate myself: the introduction of a law, as obtains in domestic matches in Australia, penalising a player who kicks direct into touch except from his own twenty-five. This has been tried experimentally in this country, and reports have shown that spectators have disapproved. My feeling is that they have done so only because they have never been given time to accustom themselves to a change designed to produce the open play that everybody is said to crave. Give them a season or two to get used to it, and I believe it would come to be accepted as an integral part of the code.

Revised Penalty Laws?

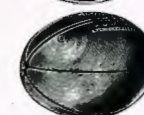
A change for the better that I do expect to see, and soon indeed at that, is an alteration of the law governing penalty kicks. During this season and for many years past, the penalty goal has been the bane of Rugby. Repeatedly sides with trustworthy penalty-kickers have beaten sides which have scored the more tries—the final travesty of justice came when the Lions in 1959 lost by one point to New Zealand though scoring four tries without reply as a result of having six penalty goals kicked against them.

The obvious change is to divide penalty goals into two categories: *direct* for serious offences, when a kick at goal is allowed; and *indirect* for minor misdeeds, when the kicker can aim where he chooses—except at goal. Opponents of this amendment claim it is too much to expect a referee to make a split-second decision as to which type of penalty he is to award, but it is surely asking no more of him than is demanded of a cricket umpire who has to give an instantaneous

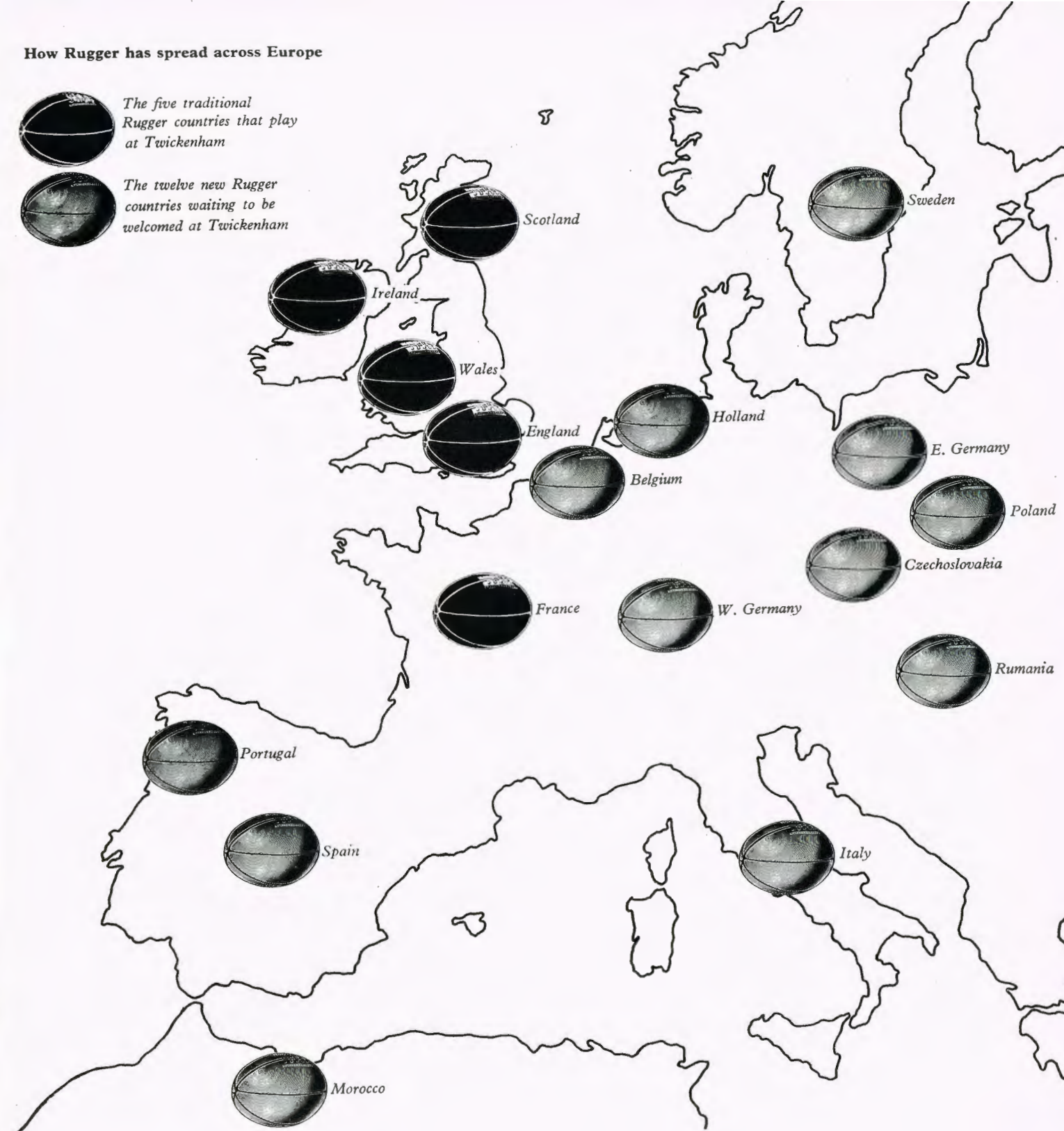
How Rugger has spread across Europe



The five traditional Rugger countries that play at Twickenham



The twelve new Rugger countries waiting to be welcomed at Twickenham



verdict on an appeal for lbw or a run-out.

This proposed change in the laws comes before the International Board in March. I believe it will have the support of the Rugby Union and I hope it is likely to be given at least a trial for a season.

The main point is that those in charge

of the game in its country of origin are wide awake to its most serious defect—the modern determination to concentrate on defence. "Fear and be slain," wrote Shakespeare; and it is true in Rugby today, particularly on the major occasion. Go into a dressing-room before a big game

(even before the Varsity Match, which should be the most open game of the season), and you will hear the players discussing the subject uppermost in their minds: "How are we to prevent them scoring?"—not "How are we to cross their line?"

Stores Superintendent

FOR Daniel Patrick Flanagan life began at thirty. That was his age when after serving eleven years in the Regular Army he married a girl from the Wilton neighbourhood, met some of the top brass of ICI staying at his wife's uncle's hotel for a conference at Guisborough, and at their suggestion applied for a job with the firm at the new Wilton project.

It was a hard decision to make. He'd risen to become a Battery Quartermaster Sergeant in the Fourth Indian Division, had seen service in the desert, at the Taranto landing and in the advance to Bologna, and after that in Greece. The Army beckoned him back. He chose ICI—and settled in Wilton before the first building had been completed on the site which is now quoted as having a capital value of £140 million. Today Flanagan is a stores superintendent of Plastics Division's Works at Wilton and responsible for the acceptance into store, storage and despatch of all the 70,000 tons of 'Alkathene' (ICI's brand name for polythene) which Wilton turns over annually.

Chain Man

He didn't get the job overnight. He began at Wilton as chain man, helping the surveyors. Then he held various other jobs, including receipt section leader, with a responsibility for all building material coming into Wilton, and shipping clerk with the Alkali Division, before taking over the task of seeing to the despatch to customers of polythene in November 1951. The plastic has left his stores to provide insulation for the transatlantic cable: it has also gone to make sheets covering cargoes, to supply the needs of the building trade for protecting buildings under construction, and of a million housewives for washing-up bowls and various kitchen utensils.

Since October 1960 Flanagan has been handling the storage and despatch of 'Propathene' (the ICI brand of polypropylene) too: a material which is heat-resisting up to 150°C., can be made into packaging film, fibres and bristles, and which with its extra rigidity is specially suitable for such applications as washing-machine tops, rotary scythe covers, and for many other purposes previously calling for metal.

He has a staff of two clerks, five checkers and one samples storeman to cope with polythene storage and despatch; one assistant foreman, one clerk and three storemen to deal with polypropylene.

I watched one wagon (to use the local name for a six-wheeler truck) loaded with its 15-ton cargo of polythene. It's the simplest and quickest operation imaginable, as conducted by a

fork-lift truck. This machine is driven into one of the four vast polythene warehouses (the latest has the lofty arched roofing of a cathedral) and helps itself to a drawerful of the product—forty 56 lb. bags neatly stacked on a pallet—which is then transported to the wagon waiting at the warehouse door. You can load ten tons in this wholesale way (it's called pallet loading) in fifteen minutes: "flat loading," bag by bag, takes four times as long.

In Flanagan's office you will find schedules for the orders in hand. There's one to Russia—big business, this! Then Saigon is waiting for polythene, the specified use being for mouldings and film packagings. Jamaica's polythene may be used for packaging cargoes of bananas. Johannesburg and Cape Town; Guatemala; Salisbury, Rhodesia; Hong Kong and Western Germany—they're all on the day's despatch list. "Rather a quiet day, really," Flanagan ruminates; "we're generally busier."

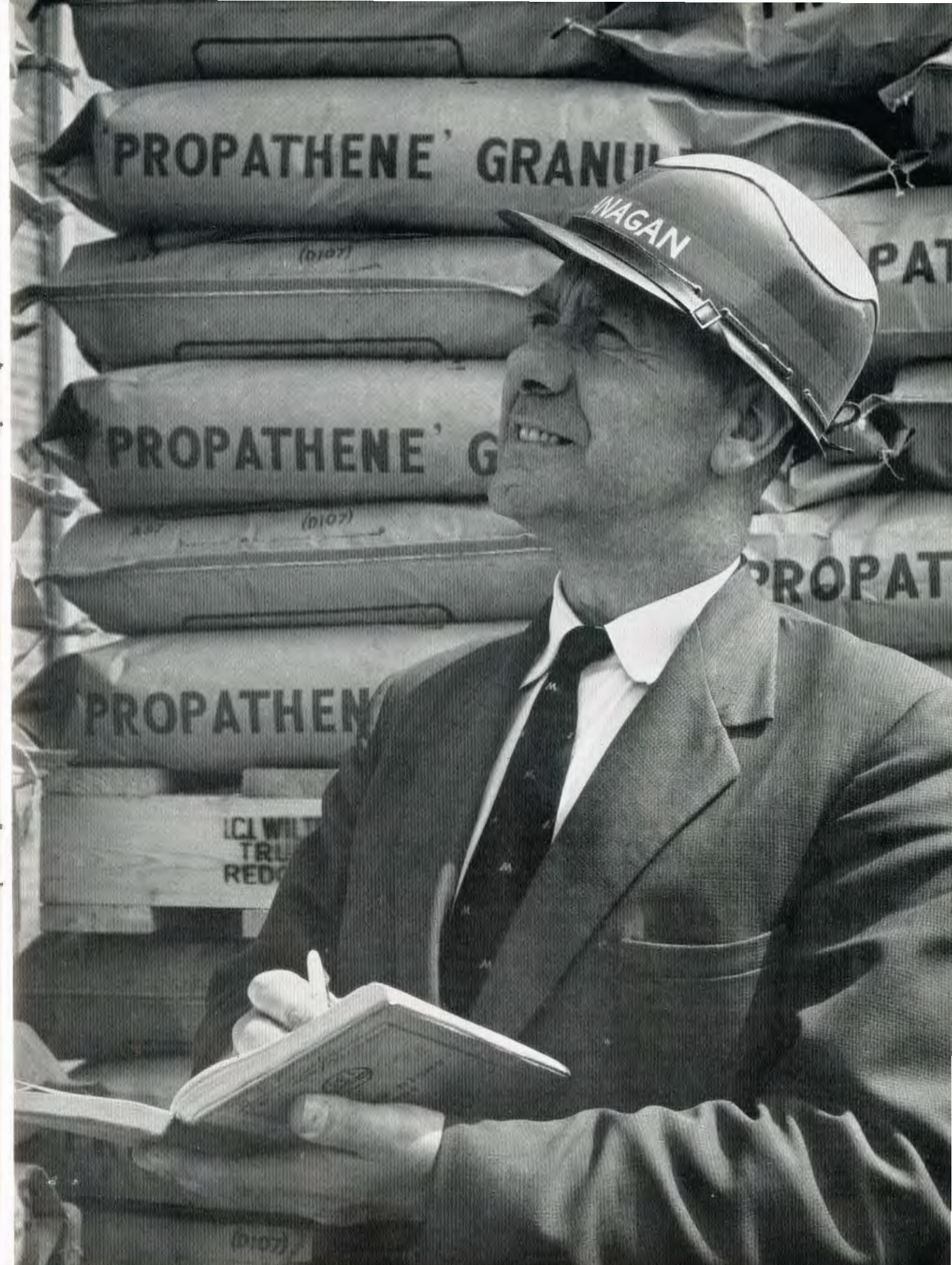
And of course it's the rush orders that have brought the grey into that crop of hair that has survived unthinned such adventures as taking part in the last action in the North African campaign and attempting to halt a runaway gun team at the Alder-shot Tattoo. Consider this little item, for example. At 4.50 p.m. (Flanagan's working hours are 9 to 5) he is told a customer wants ten tons of polythene to be delivered in London by 10 o'clock next morning—and not a minute later. It isn't a question of just stacking a wagon and away you go. The cargo has to be carefully blended and tested first, a job which takes five hours. Then at 10 o'clock sharp the loading begins. The ten tons are on the wagon, roped, sheeted, and ready to start at 10.45 p.m. At five minutes to ten next morning they have reached the customer in London, 240 miles away, and the receipt is signed.

Incidental Trials

Well, that's the way the job goes. There are, of course, occasional incidental trials and tribulations. Perhaps a customer sends the wrong directions for his cargo: the wagon has to be re-routed and the driver given instructions how to meet his deadline.

Flanagan also has to ensure that laboratory tests have been made of all the raw materials of which he takes delivery and that correct quantities are delivered.

Married, with three sons, his hobbies are motoring, camping and reading. He loved life in the Army, did Manchester-born Daniel Patrick Flanagan, but he loves life at Wilton more. After all, he's seen it grow since the time there wasn't a building standing there. You might say it's his hobby.



OPPOSITE: Daniel Flanagan

Statisticians to the Fore

THE foreman was going round the factory looking for trouble (not an ICI foreman, of course!). He came to one operative, picked up a gadget he had just made, and asked "Is this right?" "It's near enough," replied the man. "I don't want it near enough," snapped the foreman, "I want it right." "O.K.," said the man, "it is right." The foreman examined the article critically, measured it, and grunted "That's near enough!"

Although the foreman professed to demand perfection, he knew very well that absolute precision was unattainable and that variation was inevitable. This is particularly true of chemical processes and research. No matter how good the apparatus or how careful the man, no two batches of product, no two experiments, will ever be exactly alike. It is this inherent variability or uncertainty that calls for the skill of the statistician.

Theory of Probabilities

Fifty years ago statistics meant little more than the collection and analysis of figures of the type found in Blue Books and trade returns. It can still mean these things. But it can also mean mathematical techniques based on the theory of probability and better described as statistical methods. These techniques have been developed mainly during this century and are being increasingly applied to practical problems in industry, medicine, agriculture, and many other fields. They are expounded in two books written by ICI statisticians entitled *Statistical Methods in Research and Production* and *Design and Analysis of Industrial Experiments*. About 30,000 copies of these books have been sold all over the world.

The growing importance of statistical methods has led to a series of one-day conferences held by the Institute of Statisticians jointly with various large

organisations to give its members some idea of the nature and scope of the statistical work being done today. ICI held a conference for the Institute last November, and the information then released forms the basis of this article.

The Control Chart

It is possible to mention here only a few of the ways in which statistical methods can be used. One of the simplest applications is the control chart, used extensively in such industries as light engineering and synthetic fibres, and in the control of packing and weighing operations. Small samples are taken at regular intervals, and measurements derived from them are plotted on charts on which lines have been drawn to represent acceptable limits of variability. If too many points fall outside or near these limits, the process is out of control and some action is required.

A more modern version of control schemes is a system based on the cumulative sum of observations, in which the differences from the average or from the specified value are not plotted individually but totalled. These methods and the theory underlying them have been extended by our own statisticians and those of British Nylon Spinners, and they are generally more efficient than the original method.

Then, too, statistics are increasingly made use of as a means of achieving higher productivity. One technique devised and developed mainly by ICI statisticians is that known as evolutionary operation, in which repeated cycles of small systematic variations are made in the conditions of a process (such as temperature, pressure, strength of solution) in order to find out how the process could be improved. By this means it is often possible to increase the yield gradually without interrupting the process

The statistician, that skilled interpreter of statistics whose usefulness has been enhanced by the arrival of the computer, plays an increasingly important part in industry today. His advice has become a valuable aid to better management.

By Arthur Morrell

or adversely affecting the quality of the product. This technique is not suitable for all chemical processes, but it has proved very profitable in Dyestuffs Division.

Stock control is another field in which the statistician has come to the fore. Since ICI has millions of pounds tied up in stocks, much attention has been devoted in recent years to stock control with the object of releasing some of this capital. If stocks are too low they will run out frequently, with consequent loss of business. If stocks are so high that only very rarely must an order be refused or delayed, the cost of holding them will be excessive. Moreover, some products deteriorate if kept too long.

Production Planning

Statistical methods can help to determine the best stock policy and often do so in conjunction with finding the answer to the best planning of production. In those Divisions which make a wide range of products it is a constant problem to know in what order to make them and how much to make at a time. Clearly it would be uneconomic to make very small batches; on the other hand, very large batches would mean excessive stocks. Thus production planning and stock control are closely related, and both again depend on good sales forecasting. Electronic computers have greatly facilitated the statistician's work on these problems. For over two years an integrated system of sales forecasting, production planning and stock control has been running in Paints Division, resulting in substantial economies.

Distribution is yet another field in which statistical methods can save a great deal of money. For example, chlorine and caustic soda are manufactured at several widely separated works, mostly by a process which produces them simultaneously.



The Wilton Mercury computer, used by several Divisions as an aid to planning

Storage of chlorine is difficult and expensive, so production and distribution must be closely matched. Every Thursday the customers' requirements of both products for the following week are allocated to the works, taking due account of plant capacities, marginal production costs, distribution costs and transport facilities. The whole problem is teleprinted to the "Mercury" computer at Wilton, solved in about an hour, and the solution teleprinted back the same day. This application alone saves the Company several hundred pounds a week.

Sometimes problems of stock control and storage capacity can only be solved by what are called Monte Carlo methods. These are best explained by a simple example. Suppose it is desired to find the

best level of stock for a product, the demand for which fluctuates from week to week although the total annual demand is fairly stable. The approach is to select from several years' data a large number of random sequences of orders, making the selection either with the aid of a table of random numbers or by random numbers in the computer. Various levels of stock are then tried out on them to see how often stocks would have run out. Finally a level might be chosen giving a "stock-out," say, once in six months.

Research, too, makes demands on the statistician. A common problem in research, particularly when the experimental error is fairly large, is to decide how many experiments to perform. At Alderley Park several thousand chemical com-

pounds are tested each year in order to find new drugs for the treatment of disease. The question is, how many animals and how much testing capacity to use for each compound? More testing per compound will reduce the risk of overlooking a suitable compound, but it will also reduce the number of compounds that can be tested. Statistical methods help to find the best compromise.

It will be seen that the purpose of statistics and statistical methods is not merely to satisfy curiosity but to enable better decisions to be taken, and that they are playing an important part in many aspects of national and industrial life. With the development of electronic computers they are destined to play an even greater part in the future.

ICI and Courtaulds

Following the Press statement issued by Courtaulds, ICI desire to recount the history of the negotiations between the two companies, to indicate why they, for their part, have been unable to reach any compromise solution with Courtaulds, and to set out concisely the course of action they now propose to adopt.

The Negotiations

On 18th December last in the light of a current press statement indicating that there had been a leak of information, ICI announced that they had been carrying on friendly negotiations with Courtaulds for some months directed towards a complete merger of interests and announced the terms on which they had suggested to the Courtaulds Board that the stockholders of Courtaulds might be asked to exchange their stock for stock in ICI.

On the same day Courtaulds announced that they were consulting their financial advisers on the announcement by ICI.

Subsequently discussions took place between the financial advisers of ICI, the financial advisers of Courtaulds Ltd., and certain directors of the two Companies, and on 3rd January Courtaulds' representatives handed in a proposal that Courtaulds and ICI should each appoint an equal number of representatives to study and report, without prejudice to the ultimate decisions of the respective Boards, on the advantages and disadvantages from the point of view of shareholders, the textile industry and the national interest of all possible ways of strengthening the man-made fibres industry. It was proposed that the financial

advisers should participate in the studies and that the group's report be submitted to the two Boards by end of June 1962. Five examples of possible action were given, one of which was the complete merger of the two Companies. It was also proposed that the same or a similar group should study the paint interests of Courtaulds and ICI.

ICI were unable to accept these suggestions, since in the main they reiterated proposals which the two Companies had from time to time investigated and considered over a number of years without making any progress. Moreover, in ICI's view it was undesirable to allow matters to drift until end of June 1962, particularly as the course of discussions during the four months up to 18th December had led them to believe that the Courtaulds Board were seeking a solution of the problems by a complete merger and ICI had already announced the terms on which they were prepared to make an offer for the stock of Courtaulds.

On Friday, 5th January, Courtaulds issued a press statement indicating that on the advice of Baring Bros. & Co. Ltd. they would be unable to recommend their stockholders to accept ICI's offer. They also said that they appreciated the necessity for the further strengthening of the man-made fibres industry, and referred to the proposals which they had put to ICI. Their statement went on to express great confidence in the future of Courtaulds and referred to the upturn in trading conditions which would enable Courtaulds to maintain their ordinary dividend for the full year ending 31st March next at the

This recap of events leading to a higher offer for Courtaulds shares was put out by ICI as a press statement on 17th January. It appeared in full in the more serious daily newspapers, but only in abbreviated form in the popular press.

10% rate despite the cut in the interim dividend in November last.

On the morning of Monday, 8th January, while the ICI Board was sitting to consider the position, Courtaulds made two specific proposals to ICI and they suggested that if the ICI Board felt that either proposal might provide a solution to the problems, all matters of principle could be settled within a week or ten days, although the financial details would take longer to work out. The ICI Board took the view that the suggestion to consider two specific proposals with the object of trying to reach agreement within a period of seven to ten days was entirely different from the proposal to set up a committee to go over the whole ground afresh and report in six months' time. They agreed to meet Courtaulds again to see whether some proposals short of a complete merger were feasible, and a joint Press statement was issued by the two Companies in the afternoon of 8th January indicating that an announcement within ten days would be made stating whether the negotiations were proving fruitful and, if not, whether ICI proposed to proceed with their offer.

Courtaulds' Proposals

The two proposals made by Courtaulds to ICI on 8th January were: either

- (1) the formation of a joint company to deal with all melt-spun fibres, ICI having the majority interest, or
- (2) the formation of a joint company to deal with all fibres, Courtaulds having the majority interest.

These proposals have been discussed by

certain Directors of ICI and of Courtaulds in the presence of the financial advisers of both Companies, but the discussions have failed to produce any proposal acceptable to both sides.

Rejection of these Proposals

There are certain basic facts which have to be taken into account in the consideration of the Courtaulds proposals.

1. The two Companies approach the whole problem of man-made fibre production from a different point of view. The ICI view is that not only should there be horizontal integration so that research and development on one fibre can be used to benefit the whole range but also that there should be vertical integration between the manufacture of the polymer and the spinning of polymer into fibre because technical problems flow from one to the other. The Courtaulds point of view, on the other hand, is that in general the company spinning the fibre need not also be the producer of the polymer and may be in a better position if it buys polymer or other materials in the cheapest market and has not itself a major interest in polymer manufacture. This may be valid where the materials used are mainly natural in origin, as in the case of the older cellulosic fibres such as rayon. It is wholly unrealistic in relation to the new man-made fibres which are spun from complex chemical substances. In ICI's experience, the most efficient form of organisation for synthetic fibres, in particular for the newly discovered fibres, and the one which produces the cheapest chemical materials and ultimately the cheapest fibre is one in which chemical production and spinning operations are in one ownership. The practice in the United States and in Continental Europe accords, in general, with the ICI point of view. ICI are convinced that with these conflicting philosophies there would be an inherent difficulty in operating a joint company whatever the relative shareholding might be. ICI also believe that in these circumstances, with the utmost goodwill on both sides, the results of joint company operation would compare unfavourably with complete integration from the point of view of the stockholders in both Companies and the national interest.

2. ICI's investment in man-made fibres, including both the production and spinning of the polymer, at approximately £100 million already approaches the total

Courtaulds interests in fibres, including their investment in the old-established and less rapidly growing fibres such as viscose and acetate rayon, and much in excess of their investment in the new and rapidly growing synthetic fibres.

3. ICI's total profits from the production of fibres and of the polymers from which the fibres are spun are, we believe, already greater than Courtaulds profits from all fibre sources at home and overseas, including rayon.

4. With its nylon polymer production, its half-share of British Nylon Spinners Ltd., and its polymer production and spinning of 'Terylene' and of the new polypropylene fibre 'Ulstron,' ICI's interests in the newer man-made fibres already far outweigh those of Courtaulds. Moreover, by virtue of the scale of their research and development effort and basic chemical knowledge of polymers used for plastics as well as fibres, ICI are better equipped than Courtaulds to discover and develop newer synthetic fibres.

5. The distinction drawn by Courtaulds between melt-spun fibres and other synthetic fibres cannot, in the ICI view, provide a technically sound dividing line between different fibres for the purpose of setting up a joint company, since the objective, largely dependent for its success on chemical research, is to produce new and better fibres for the textile industry independently of whether they are wet-spun, solution-spun or melt-spun.

Thus, having regard to ICI's superior profit position in fibre manufacture and its prospects in future developments and expansion, ICI clearly could not agree to the pooling of all its fibre interests in a company in which Courtaulds would have a majority position. Nor could they agree to the setting up of a joint company limited to melt-spun fibres.

ICI's Proposals

ICI have accordingly decided to proceed with their proposal for a complete merger. The primary objectives of such a merger are, as stated in ICI's original press announcement on 18th December, that the UK man-made fibres industry would by this means be as integrated as the comparable industry in the USA and Continental Europe. As a consequence duplication of effort would be avoided and savings effected in current operations, both manufacturing and marketing. There

would also be better utilisation of the available research and development facilities and of capital resources. There would also be economies and improved efficiencies in other fields of common interest to the two Companies such as packaging film, paints and chemicals.

The Board of ICI appreciate that, whereas in November 1961 the profit estimates of Courtaulds prompted the Board of that Company to reduce the interim dividend from 10d. to 9d. per £1 unit, the most recent estimate forecasts a profit before tax for the year ending 31st March 1962 of £17.5 million, which must be compared with the substantially lower estimate on which ICI's December terms were based. Moreover, this latest forecast will enable the total Courtaulds ordinary dividend for the year to be restored to the previous figure of 2s.

Taking this into account, the Board of ICI have decided to offer to Courtaulds ordinary stockholders an exchange into ICI ordinary stock units for every five Courtaulds ordinary stock units. Thus for every £1 Courtaulds stock, valued on 15th December 1961 at 30s., there is offered an ICI stockholding which would have been valued on 15th December at 47s. 2d. and, using the closing price of ICI on 17th January 1962, is now valued at 46s. 4½d. Moreover, a Courtaulds stockholder accepting the offer will find his income, on the basis of the present ICI dividends, increased by one-tenth.

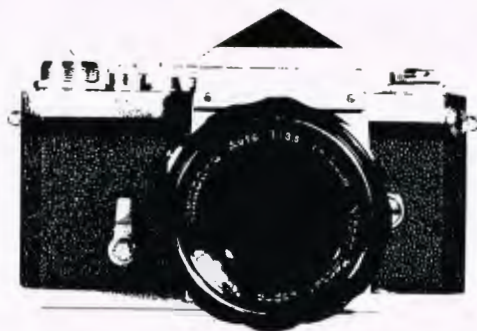
At the same time the offer to the preference stockholders of Courtaulds will be improved as follows:

- For every 5 Courtaulds 5% Cumulative First Preference Stock units of £1—
5 ICI 5% Cumulative Preference Stock units of £1 plus 5s. in cash.
For every 5 Courtaulds 6% Cumulative Second Preference Stock units of £1—
6 ICI 5% Cumulative Preference Stock units of £1 plus 5s. in cash.

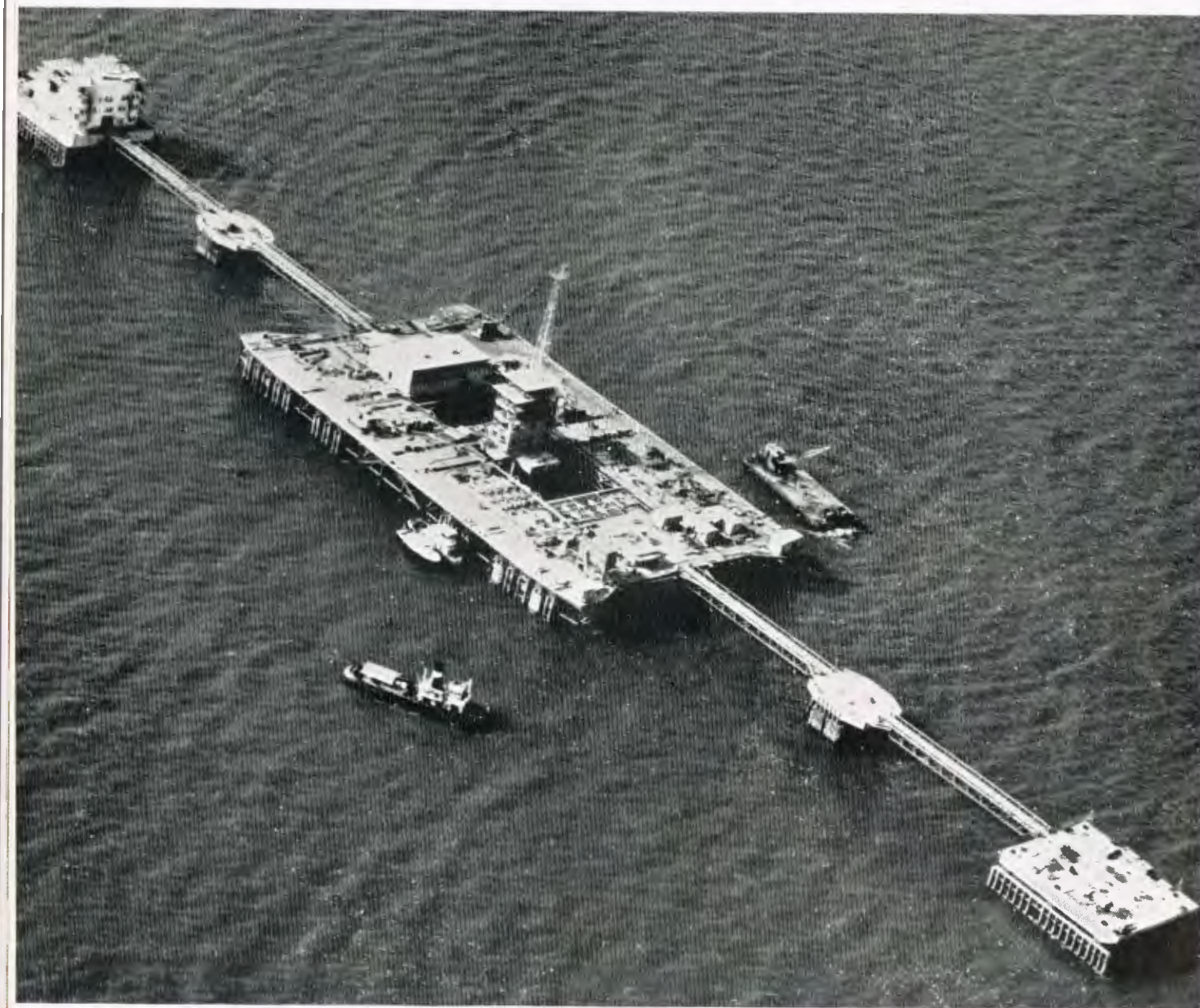
ICI's financial advisers, Robert Fleming & Co. Ltd. and Morgan Grenfell & Co. Ltd., have stated that in their opinion these terms for both the ordinary and preference stock are fair to the stockholders of both Companies. Circular letters from these two firms jointly, making the formal offer to Courtaulds stockholders on behalf of ICI, will be posted as soon as possible.

The assurances given in respect of staff made in our press announcement of 18th December 1961 are reaffirmed.

NEWS IN PICTURES



Home and Overseas



An aerial view of the deep water loading terminal belonging to the Basrah Petroleum Company which is under construction 25 miles offshore at the northern end of the Persian Gulf. It has been built to overcome the inability of large tankers to navigate the port when fully laden and will be able to berth two 65,000 ton tankers simultaneously. ICI titanium anodes are being used to prevent corrosion of underwater structures



No snow. Nobel Division skiers who headed for the snowfields for their first outing of the season on Sunday, 7th January, were beaten by a thaw. At Killin, where they were to spend the day, there was little snow, and that was quickly wetted by incessant rain. However, the next weekend, spent at Glencoe, more than made up for their earlier disappointment. The Nobel Ski Club, formed three years ago, now has seventy members. Trips are planned for most weekends until Easter



Star turn. Beryl Reid, star of stage and television, provided the comedy at the smoking concert which accompanied the presentation of St. John Ambulance awards to employees at Winnington. Above she has a saucy smile for Messrs. Pogson, Williams and Westwood. The awards were presented by Dr. O. P. Edmonds, medical officer with the North-west Division of the National Coal Board and area surgeon for the St. John Ambulance Brigade. Alkali Division now has over 400 qualified first-aiders, or more than one to every 20 payroll employees



Belles in the belfry. The two bellringing sisters of the Alkali Division, Margaret and Kathleen Hewitt, add a touch of youth to the centuries-old belfry of Weaverham Parish Church, Cheshire. Margaret (right) is a filing clerk with the Salt Sales Control Department, and Kathleen is a Sansomatic machine operator with Central Sales Ledger. Margaret took an active interest in campanology seven years ago, and she is now sufficiently skilled to ring any of the six bells at Weaverham Church. She introduced her sister to the hobby four years ago



Cricket film show. Freddie Trueman, Yorkshire and England fast bowler, was a guest of the Synthonia Cricket Club at Billingham recently when he showed his own colour film of the MCC tour of the West Indies in 1959-60 and of a tour made by the Commonwealth Cavaliers Club of which he is a member. Here he is seen (left) chatting to club officials Mr. W. K. Hall (president), George Crawford (first XI captain) and Dr. A. Sykes (secretary)



Dance champions. On 29th January Mr. Lawrence Norton (General Chemicals Division) and his partner Miss Catherine Wightman represented the North-west of England in the semi-final round against West Scotland in BBC Television's programme "Come Dancing." Mr. Norton and his partner were the Old Time representatives and danced as the UK Olde Time Dance Champions, the title they won recently

RIGHT: New trimaran. The prototype of the new Shark class trimaran (a yacht with a main hull and two outriggers) fitted with a 'Terylene' sail of unusual design made by Anderson Aerosails of Shoreham. The top part of the sail is fully battened, but the foot is loose. Over 95% of all sails on show at the Boat Show last month were of 'Terylene'



Farewell dinner. A Chinese dinner was held by the board and staff of ICI (China) as a farewell to their retiring chairman, Mr. C. A. Wright. Mr. and Mrs. Wright are seen here admiring a gift of Chinese curios. In the background is Mr. J. Hackney, who has succeeded Mr. Wright as chairman



TA awards. Viscount Leverhulme, the Lord Lieutenant for Cheshire, presents a certificate of merit for outstanding service and devotion to duty to Sgt. F. Boyd, 326 Signal Squadron, during a ceremony at the Northwich Territorial Army HQ. In civilian life Mr. Boyd is a lab. assistant with the Electrical Investigation Department at Winnington. Another Alkali Division man on the awards list was Staff Sgt.-Major G. Ford, a clerk in the Time Office at Winnington



Oldest guest. When Mr. Fred Wilkinson of Avenue Works was invited to the Alkali Division dinner for retiring employees and their wives recently, he took his mother, 90-year-old Mrs. Ruth Wilkinson, along with him. Here they are with a toast for good health in the New Year. Mr. Wilkinson is retiring after 47 years' service



Tasty turkey. 'Melinex,' the transparent 'Terylene' film produced by Plastics Division, found its way into several Divisions' kitchens at Christmas. At Nobel Division, where our photograph was taken, all the 2250 lb. of turkey consumed at the Christmas lunch was cooked in jackets of 'Melinex.' It gives a similar result to cooking by foil, but has advantages even over this method. For one thing 'Melinex' lets the cook keep an eye on progress, and since the bird is completely sealed, cooking time is reduced

People and events . . .

ICI and Courtaulds—the Proposed Merger

MR. S. P. Chambers, ICI Chairman, held a press conference at Imperial Chemical House on 18th January to elaborate on the previous night's statement that, since ICI had been unable to reach a compromise solution with Courtaulds, the ICI Board had decided to proceed with their proposal for a complete merger.

The terms now being offered to Courtaulds' shareholders are four ICI ordinary stock units for every five Courtaulds ordinary stock units (instead of three for four). The revised terms have been influenced by Courtaulds' improved profit estimates for 1961, made public by Courtaulds after ICI's original bid was announced.

ICI's press statement reiterated that the chief objective of the merger was to render the British man-made fibre industry "as integrated as the comparable industry in the USA and continental Europe. As a consequence, duplication of effort would be avoided and savings effected in current operations, both manufacturing and marketing." The statement is reproduced in full on page 56.

Preparing for the Next Cold Spell

THE start of the new year saw lorries converging from all parts of the country on ICI's Meadowbank Mine at Winsford in Cheshire to load up with ground rock salt. The salt is required by local authorities to help keep the roads free from ice and snow. In the first week of January the Alkali Division received orders from local authorities for about 70,000 tons of rock salt—more than 7000 lorry loads. Later last month teleprinters at Division headquarters were still chattering away bringing in yet more orders.

Almost all the salt being ordered is for replenishing stocks built up by local authorities during the summer and autumn months last year. This present heavy demand for stock replenishment is the second this winter, for ICI received orders for 43,000 tons of rock salt in December, mainly from local authorities in the north of England and Scotland.

At the end of last year's relatively mild winter well over 100,000 tons of salt was

still in stock at local authorities' depots, and ICI alone supplied a further 100,000 tons during April–November last year. Had it not been for this foresight on the part of local authorities the demand this winter would have been overwhelming.

At Meadowbank Mine mechanised shovels loaded rock salt into lorries throughout the day and into the night during the period of heavy demand. In the first week of the year 30,000 tons of rock salt were despatched from the mine. Most of the salt was loaded from stockpiles which were built up to meet an emergency such as this. There has been a sense of urgency about the whole operation, for no one knows when ice and snow will next strike at Britain's roads.

Changes at Witton

IT was announced on 4th January that ICI is to reorganise its metal interests under a new holding company, Imperial Metal Industries Limited. The present Metals Division will become a new operating company, Imperial Metal Industries (Kynoch) Limited, wholly owned by the holding company.

The Board of Imperial Metal Industries Ltd. will be **Dr. James Taylor** (chairman), **Mr. S. F. Burman**, **Mr. Michael Clapham**, **Mr. Peter Menzies**—all ICI Main Board directors—and **Mr. St. J. Elstob**, the present chairman of Metals Division. The board of Imperial Metal Industries (Kynoch) Ltd. will be the same as the Metals Division board.

The new organisation will permit a greater concentration of effort on a side of the Company's activities which is materially different from our main chemical interests, and it is hoped by this means to improve the competitive position of ICI's

metal interests not only at home but in EEC and world markets.

The three aluminium companies jointly owned by ICI and ALCOA—Imperial Aluminium Co. Ltd., Impalco Foils Ltd. and Almin Ltd.—are not affected by this reorganisation.

Economic Adviser

SHORTLY before Christmas the Dutch press reported the resignation of **Dr. Jacob Kymmell**, Director of European Integration in the Dutch Foreign Ministry, due to his projected appointment as economic adviser to ICI's European Council. Dr. Kymmell started his new job on 1st February and is now working on the Council's affairs from the ICI (Holland) offices in Rotterdam.

A graduate of Amsterdam University, Dr. Kymmell is a lawyer by training, but from the time he took his doctor's degree by writing a thesis on international economic law he has always specialised in economic matters. In this field he has had a distinguished career in Dutch industry and Government as well as in the academic sphere. Besides his job with the European Council Dr. Kymmell is Professor Supernumerary of International Economic Relations in Rotterdam and will continue to devote some of his time to lectures. He is 40, and is married with three children.



Dr. Kymmell

In his recent Government post—equivalent to a top-ranking job in the British Civil Service—Dr. Kymmell was responsible for the co-ordination of Dutch policy on European integration. Apart from determining the main outlines of policy, this meant organising the activities of all departments at The Hague which are concerned with implementing the three European Communities—Coal and Steel, Euratom and, in particular, the Common Market. With this background of experience Dr. Kymmell will be invaluable in advising the Council on how ICI may best take advantage of the many opportunities for the chemical industry in Europe today.

New CIL President

MR. Leonard Hynes, who takes over next month as president and chairman of the executive committee of Canadian Industries Ltd., is 50. He has spent all his working life with CIL, which he joined on graduating as a chemist from Toronto University in 1933.

He went first to the company's chemical works at Hamilton, Ontario, and during the next ten years he held a number of appointments, principally on the sales side of the Chemicals Division, until his appointment as management committee secretary in 1943. Five years later he was appointed assistant manager of the Chemicals Division and in 1951 general manager of the Paints and Coated Fabrics Division. In 1954 he became a vice-president and a director of CIL.

Mr. Hynes has been a frequent visitor to ICI in England during the past few years and has also visited other ICI affiliated companies in Australia and New Zealand and other parts of the world.

Mr. Hynes has been a member of the executive council of the Canadian Chamber of Commerce since 1955 and was



Mr. Hynes

In Brief

Gifts from Wilton. Christmas presents worth £1000 went out from Wilton from the Wilton Site Charities Fund. Altogether 23 organisations received cheques or gifts for the children, old people, sick and handicapped they represent.

Medical Officer honoured. Colonel **F. A. Bearn**, works medical officer at Alkali Division's Buxton Lime Works, has been invested as a Knight of the Venerable Order of the Hospital of St. John of Jerusalem.

WVS medal. Twenty years' service with the WVS is the proud record of **Mrs. A. K. Kidger**, a cleaner at the Wilton Recreation Club. To mark this she is to receive the WVS long service medal, given by the Queen for presentation to members with 15 years' or more continuous service.

Cheaper drug. Pharmaceuticals Division has halved the cost of treatment by griseofulvin, widely used for infections of the nails, skin and hair. Research has shown that by reducing the particle size of the drug half the dose is as effective as that previously given to patients. The cost of treatment to the National Health Service is therefore reduced accordingly.

Athletics post. A member of Nobel Division Staff Department, **Mr. J. McL. Bone**, has been appointed to the twelve-man committee of the Scottish Amateur Athletic Association.

Breaking the ice. On Christmas morning **Brian Cresswell**, a trainee at Paints Division's Stowmarket Factory, took part

in the annual swim of the Ipswich Swimming Club. The hardy swimmers first had to break the ice, which was thick enough to stand on, while the thermometer registered 34 degrees in the water.

£100 idea. A Castner-Kellner Works (General Chemicals Division) employee, **Mr. Cyril Baker**, was recently awarded £100 under the ICI Suggestion Scheme. His idea was for an improved rodding device for clearing through the build-up at the base of a tetrachloroethane reactor preparatory to cleaning the reactor.

Cricket trophy. **George Crawford**, Billingham Synthonia Cricket Section's first team captain, has been awarded the Wilfred Rhodes Trophy for the best batting average in the Minor Counties Competition. In ten innings for Durham County he scored 490 runs, with four times not out for an average of 81.6.

Gold medal. A 23-year-old ex-student apprentice now working in the Wilton Engineering Department, **Mr. Fred Baines**, recently received the Principal Wells gold medal as the best student in the final year of the Diploma in Technology course at Battersea College, London. He was incidentally the first Wilton employee to gain a diploma in technology.

Visitors. In 1961 visitors to the Research Laboratories of Pharmaceuticals Division at Alderley Park numbered about 1900. They included representatives of almost every branch of medicine as well as veterinary surgeons, hospital pharmacists, students, and groups from scientific societies.

chairman of the council for 1960–61. He is a director and president of St. Mary's Hospital, Montreal, and was general chairman of the 1959 campaign of the Montreal Federation of Catholic Charities. He is also a member of the Chemical Institute of Canada, the Canadian Institute of Mining and Metallurgy, the Society of Chemical Industry, the Montreal Board of Trade, and the American Management Association.

Outside work he has always had a great interest in sailing, and he is a member of the Royal St. Lawrence Yacht Club and the Royal Canadian Yacht Club of Toronto.

Should Britain go Decimal?

WHAT does the Company think about Britain going over to decimal coinage? ICI's view is that, although the change would cost us at least £500,000, we are broadly in favour of it provided there is overwhelming support from business interests and provided the change is compulsory.

Support for the change has grown in

recent years with the prospect of Britain going into the European Common Market. These countries all use the decimal system. Two years ago a joint report was issued by committees of the British Association for the Advancement of Science and the Association of British Chambers of Commerce after they had jointly carried out a nation-wide survey.

ICI was one of the companies which answered questions from the British Association. Asked to list the advantages which it would gain from the changeover, the Company replied that bringing in decimal coinage would:

1. Ease clerical work, particularly on wages.
2. Ease manual and machine calculations and reduce the number of errors.
3. Assist the conduct of the export trade.
4. Possibly simplify the wage rate structure and reduce the cost of accounting equipment.

It has been estimated that these advantages would result in savings to the Company of something less than £100,000 a year, and that the initial cost of the changeover would be at least £500,000.



'Procion' dyes and wax crayons is the unusual medium used for this picture by Olga Moyle (see 'Procion' Paintings)

New Year Honours

THE names of two ICI men appeared in the New Year Honours List. **Mr. Peter Fitzpatrick**, agricultural sales manager in Northern Ireland, gets the OBE and **Mr. Oliver Hornby**, a process worker on the 'Perspex' Plant at Billingham, the BEM.

Mr. Fitzpatrick, who is 58, has been with the Company for 34 years, and for all except two of them he has been attached to the Belfast Office. He comes of farming stock and was one of the first



Mr. Fitzpatrick

Mr. Hornby

seven men to receive a B.Agr. degree from Queen's University, Belfast. During his early days in ICI he had the task of showing the old-type farmers how they could make more money from milk by growing two blades of grass where one grew before. To do this involved him in a gruelling schedule of evening lectures over a prolonged period. Being a glutton

for hard work, he then took to the air on the Northern Ireland BBC with "Farmers Work and Worry" and the children's programme "Peter comes in from the Farm," which he has broadcast regularly for twenty-six years.

His ambition when he retires in four years' time is to live at the foot of the Mourne Mountains and perhaps to find himself a farm there.

Mr. Hornby is 49 and has been with ICI since 1929 and Plastics Works since 1937. He takes a keen interest in trade union matters and has been secretary of the Plastics branch of the TGWU since 1956 and a shop steward in the works since 1958. A voluntary fireman for many years, he holds the 15 years' service award. He is also a plant safety man. His other interests include welfare work—he is closely connected with the work of a local children's orphanage, and he spends some of his leisure time sick visiting. Mr. Hornby served for six years during the last war in the Royal Signals.

Another honour of interest is the award of the CMG to **Mr. M. A. Cuming**, a non-executive director of ICIANZ, for services to Australian industry.

'Procion' Paintings

THE delightful picture at the top of the page is the work of the head of the art department at Kidderminster College for

Further Education, Mrs. Olga Moyle. Her medium is an unusual one—ICI 'Procion' dyes and children's wax crayons.

She hit on this idea when working with a group of her students on a colour and design project with stained glass as its theme. She found difficulty in achieving on paper the warmth and surface quality of the stained glass. Watercolours proved ineffective. They were not brilliant enough and were unsuitable for large areas anyway. Coloured inks were also tried, but without much success. Then Mrs. Moyle borrowed some of the ICI 'Procion' dyes being used to good effect by the fabric printing department of the College. Paper, of course, consists of cellulose just as does cotton, and 'Procion' fibre-reactive dyes are equally well "paper-reactive" dyes. The results were very promising.

Mrs. Moyle's next step was to adopt the Javanese wax-resist technique of batik printing, using transparent wax to blank off the parts to remain uncoloured or to fix coloured areas by preventing contact with subsequent applications of different-coloured dyes.

The sight of a box of wax crayons in a shop window suggested the final step. She now sketches out the preliminary design in coloured wax, blanks off the parts to remain uncoloured with transparent wax in the batik manner, then goes to work with 'Procion' dye solutions, building up the design in successive layers. The solutions are applied with a brush or a felt pad, shading and blending being cleverly achieved by Mrs. Moyle in conjunction with wax crayon work.

Conditions in Kenya

THE Magadi Soda Company has been fortunate in escaping the worst of the catastrophic floods which have now followed the eighteen-months-long drought in Kenya. Sometimes during the rainy season the lake of solid soda crystals is covered with up to about six inches of water. The latest report is that the water level has risen to over eighteen inches and heavy rains are still falling. In spite of this, production has been kept up. Transport, however, has been seriously upset. At one point the road to Magadi was cut and for a time the water supply ceased. Rail transport to the coast was also disrupted. For nearly a fortnight there was no traffic between Nairobi and Mombasa, but luckily all immediate shipping commitments could be met from stocks in Mombasa.

During both the drought and floods the company has done valuable relief

work among the neighbouring Masai tribesmen by distributing much-needed food supplies in the surrounding country, and was also responsible for rescuing 200 Masai marooned by the floods on Mount Shombole, about 30 miles from Magadi.

Cairngorm Rescue

TWO Nobel Division men, **Mr. Muir Boyle** and **Mr. Edward Whitelaw**, saw 1962 in as members of a mountain rescue team. The story of the struggle to find two climbers who had fallen down a corrie on Cairngorm on a night of near-blizzard conditions appeared in a number of papers.

The two ICI men were in camp with other climbers from Saltcoats and Stevenston near Loch Morlich Youth Hostel when they learned that the police were organising a night rescue operation for the missing climbers. Because the weather was so severe, they were sure another night of exposure—the men had started out to climb Cairngorm on the Saturday—would end in tragedy. The Saltcoats party, with other climbers from the hostel, volunteered to join the rescue party along with instructors from the mountain centre at Glenmore Lodge.

They eventually found the two missing men, one unconscious from cold and exposure, in the early hours of the morning. Then began the difficult journey back with the unconscious man strapped to a stretcher mounted on skis. The cold was so intense that the unconscious man's breath was freezing on his anorak as he lay.

Around 4 o'clock they were joined by the RAF rescue team which had travelled over 60 miles of hazardous road from Fort William. By the time the operation was safely completed, more than eight hours after it began, rescuers as well as rescued were physically exhausted. It was a Hogmanay neither Mr. Boyle nor Mr. Whitelaw is likely to forget.

Further Fleck Awards

THE two remaining Fleck Awards for 1961 have now been made. They go to **Harold Rogers**, a 19-year-old apprentice instrument artificer at Alkali Division's Wallerscotte Works, and **Kenneth Olley**, a 20-year-old student apprentice at present with the Wilton Engineering Department.

Harold, whose father, **Mr. Lal Rogers**, was until recently a member of Winnington Works Council, joined the Alkali Division from Hartford Secondary Modern School three years ago, and is at present working on his S2 National



Mr. Rogers

Mr. Olley

course at the Mid-Cheshire College of Further Education.

Outside work, Harold has an absorbing interest in the sea and ships, and he likes to motor scooter to Liverpool to do some ship spotting whenever he has a few spare hours.

Harold has gained a number of certificates for piano playing, and he takes every opportunity of playing the organ in Castle Parish Church, where he sings in the choir and performs the duties of processional cross bearer, and server for Holy Communion. He is also a member of Northwich Festival Choir.

On Saturdays he can usually be found helping a friend on his smallholding and, with all other evenings of the week taken up with night school, homework or choir practice, he still found time on several Friday evenings before Christmas to help to design and prepare decorations for a ward at the Grange Hospital, Weaverham.

Kenneth Olley, who was chosen from a record 58 candidates, is an old boy of the Sir William Turner Grammar School, Redcar, and has been with ICI since 1957.

He is an assistant scoutmaster with the 1st Marske Troop and a member of the 1st Saltburn Rover crew, becoming a Queen's Scout in 1957. He attended the Queen's Scout parade at Windsor in 1958. He is also a member of the Redcar Jazz Club, a committee member of the Marske Young People's Association, and, by virtue of completing the famous walk, a member of the Lyke Wake Walk Club.

He plays soccer for Marske seniors, table tennis and cricket for Marske CC, and has had a soccer trial with Middlesbrough FC.

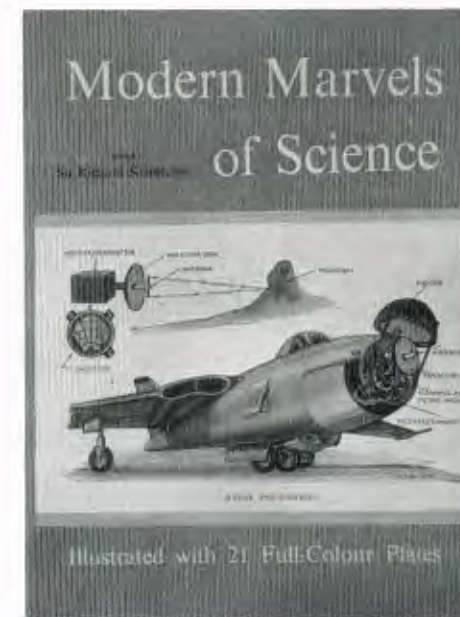
He is at present taking the second year of the Higher National Certificate course in Civil Engineering at the Constantine Technical College, Middlesbrough.

Modern Marvels

MODERN Marvels, our series of articles on some of the remarkable machines which check, test and demonstrate the ideas and researches of scientists, has now appeared in book form. It is published as a commercial venture by Phoenix House Ltd. at 10s. 6d. We lent our four-

colour plates for the illustrations, and the Editor, **Sir Richard Keane**, wrote the foreword.

The *New Scientist's* reviewer comments: "Lest '48 pp., 10s. 6d.' should not look like value for money, it should be explained at once that the pages are large—the book measures 11 in. by 8 in.—that the paper is glossy and the print handsome, and that there are 21 full-colour plates illustrating the various machines whose purpose and working the text describes."



"Each of the 20 short essays explains some device of importance to science and technology, such as the electronic computer, the free piston engine, the blast furnace, the electron microscope, radar and radomes, the mass spectrometer, the infra-red and ultra-violet spectrophotometers, zone refining, X-ray crystallography and the cyclone boiler. They were originally published in the *ICI Magazine* to interest ICI employees; the demand for popular but authoritative scientific explanation undoubtedly justifies their presentation in book form to a wider public. The book should be a much appreciated addition to school and public libraries."

50 Years' Service

The following employees have completed 50 years with the Company: **Alkali Division:** Mr. J. H. Pugh, Stoke Salt Works (31st December). **Metals Division:** Mr. W. A. Ward, Kynoch Works (30th November 1961).

Correction

In our note 'last month about 'Genklene,' General Chemicals Division's new solvent, this product was wrongly described as 1,1,1-trichloroethylene. This should have read 1,1,1-trichloroethane.

All this—and gardening too

By Peter Schofield

Many ornithologists have made famous studies of individual birds. David Lack's *Life of the Robin*, James Fisher's *Fulmar*, E. A. Armstrong's *The Wren* or John Buxton's *The Redstart* are but a few studies which have been published in popular form. The garden is an ideal place to start such a study because it can be conveniently watched regularly.

Common birds which can be seen in most gardens are song thrush, blackbird, blue tit, swallow, willow warbler, robin, house sparrow, starling, chaffinch and hedge sparrow. They are to be seen nearly every day in any garden. Others that might be seen are willow tit, coal tit, long-tailed tit, wren, house martin, swift, bullfinch, linnet, spotted flycatcher, chiff-chaff, whitethroat and pied wagtail. Already the list is well into the twenties!

The home birdwatcher's basic equipment is a pencil, a notebook, and a bird recognition book. I would recommend *A Field Guide to the Birds of Britain and Europe* by Peterson, Mountfort and Hollon, published by Collins (25s.), or *The Observer's Book of British Birds* by S. Vere Benson, published by Frederick Warne and Co. Ltd. (5s.).

By increasing the food, water, shelter and nesting sites, you can soon add to a garden's bird population. Shrubs, particularly holly, berberis and hawthorn, do help these very three things. Some birds eat seeds or fruit, while others eat insects. Berried shrubs will not only provide food for the first group of birds but will probably help to increase the insect population and thus attract more insect-eating birds.

Bird tables tend to be ignored by birds in the spring and summer when other sources of food are plentiful. They do, however, come into their own in the

autumn, particularly in cold weather. They are easy to build. A simple tray about eighteen inches square is ideal, with a hook on the underside from which the carcass of a chicken or half a coconut filled with fat can be hung. Coconuts are particularly popular with tits and wrens, while a robin will spend hours trying to perch on the rim of a coconut. Incidentally, a robin is slow to learn coconut technique. When he eventually discovers how to obtain the fat for the first time, it will still take him a time or two before he does it on every occasion.

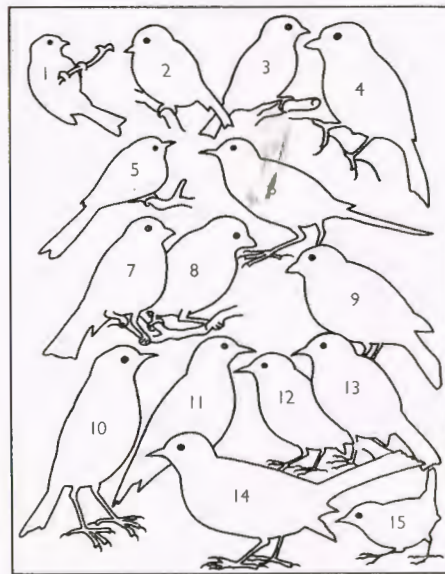
A water bath is an essential. It has often surprised me to watch birds taking a bath in the coldest weather. The bath must be kept free from ice so that the birds can get a drink. Some birds will visit a garden to drink even though they don't feed or nest there. The size of the water bath is not so important as the depth. The water should not be more than an inch deep, and there should be a few flat stones projecting a quarter of an inch for birds to stand on.

The winter months are the time for putting out nesting boxes so that birds will already be accustomed to their position by the time they start site hunting. There are many kinds of nesting boxes. A plain wooden box with an entrance hole works, but a more natural and attractive box can be made from hollowing out a pine log or covering a box with pine bark. Boxes for smaller birds such as the tits or nuthatches should be approximately nine inches deep and six inches in diameter. The entrance hole should not be much more than one inch in diameter, or house sparrows or even starlings will take over. Boxes with hinged tops or fronts are often used so

that the birds and young can be observed in the nest.

Two things to remember: birds don't like being disturbed too often, and nesting boxes should not be on a south wall because they will heat up too much. Place them at varying heights, but remember most birds prefer to nest a few feet from the ground. In my nesting boxes I have had great tits, blue tits, nuthatches, house sparrows and a starling. The last two nested only because the entrance holes were much too large for the tits.

In any one season there will always be the incident which you will never forget. It may be a migrating pied flycatcher resting on the garden wall or a pair of hawfinches such as I saw twice last year.



1 Blue tit. 2 Willow tit. 3 Coal tit. 4 Great tit. 5 Long-tailed tit. 6 Pied wagtail. 7 Male bullfinch. 8 Male chaffinch. 9 Male house sparrow. 10 Song thrush. 11 Starling. 12 Hedge sparrow. 13 Robin. 14 Male blackbird. 15 Wren



PETER SCHOFIELD



The lost city

For nearly 400 years it lay swallowed up in undergrowth. Abandoned soon after the Spaniards arrived in Peru in 1532, it was not until 1911 that this fabulous lost Inca city was rediscovered by a visiting American professor.

By Margaret Farrell

Photographs by R. C. Todhunter

ATLANTIS, Shangri La, Eldorado—the magical names of these lost and legendary cities have knocked on the doors of man's imagination for centuries. The city of Macchu Piccu is an Inca legend which came true fifty years ago.

In 1911 Hiram Bingham, a young professor from Yale, was searching, as he had done many times before, for such a city. In the Andes above the Urumbamba river he received the first hint of success from an Indian, Melchor Artega, who knew that the ruins of an Inca city lay between two peaks above the river. Hiram Bingham and his Indian guide climbed two thousand feet above the canyon and saw "a flight of beautifully constructed stone-faced terraces, a semicircular wall, a temple, plazas, courtyards." The sight held Bingham spellbound, as it holds visitors fifty years later.

For me the magic of the journey to Macchu Piccu started in the Imperial city of Cuzco, when in the early morning I made my way to the station through crowds of tiny boys all fighting to carry my luggage, all yelling "Monies, Missus, monies!" I squeezed myself into an odd-looking train which zigzagged its way up and down mountains and along the valley of the Urumbamba. The Urumbamba is a small river, but purposeful. It flings itself against great boulders lying in its path as it races between banks lined with gorgeous-coloured flowering trees on its way to the Amazon.

Every now and then the train stopped at wayside stations crowded with gaily dressed women carrying solemn babies on their backs, wiry men chewing incessantly on the coca leaf which alone makes life bearable in this fierce poverty-stricken land, and large-eyed children who watched silently.

Half-way through the four-hour journey we stopped at a café beside the tracks for coffee. If you patronised the official stopping place on the platform you could buy coffee—dubious-looking but hot, and served with charm and friendliness by the owner and his wife.

But I was curious and wandered to the other side of the tracks. Here in a windowless one-roomed house you could buy chicha, the native beer. The one room was shared by humans and animals, and on the earth floor dozens of guinea-pigs scampered. The guinea-pig is the main source of meat for the Indians and is regarded as a great delicacy, to be eaten only on feast days.

Two hours later the train reached the end of its journey, but

the lost city was not quite yet. I crossed the railway track carrying my luggage and made my way down a steep rocky path and across a meagre-looking suspension bridge swinging above the river. Across the bridge buses waited to take the visitors to the hotel two thousand feet above. The road was narrow and full of terrifying hairpin bends. Most of the time half the bus wheels were hanging over the edge, but as the driver said, "Why do you worry? I have also two more wheels, and for a long time now we have no accidents."

Whether you enjoy the journey or not depends on your temperament. Some of my travelling companions wailed "Why did we ever leave Florida?" and kept looking down to the silver thread of the river instead of up to the most mystic peaks in the world.

The hotel was comfortable and friendly except for the pet vicuna tethered on the terrace. He hated everyone, including his owners.

Just beside the hotel is the lost city—all grey and green: green grass, grey stone, and the darker green of the two mountain peaks which cradle it. When did the Incas build this fantastic



OPPOSITE: Two views of the lost city—"all grey and green: green grass, grey stone, and the darker green of the two mountain peaks which cradle it"



place, and why? There are many explanations. It may have been the earliest Inca city or the final flowering of the building genius of Pachachouta, the Inca emperor who rebuilt Cuzco into the magnificent Imperial city which Pizarro conquered. It may have been one of a chain of agricultural centres or one of a line of fortresses. Some imaginative archaeologists think it was a sacred city, the home of the Virgins of the Sun. Certainly when the graves were opened only female skeletons were found.

In spite of the Incas' great achievements, their successes in war, their skill in weaving beautiful fabrics and their artistry in working gold and silver they left no written language, so much of the story of Macchu Piccu can never be known.

The city was called Macchu Piccu by Hiram Bingham. He named it after the larger of the two mountain peaks. Macchu Piccu means "Old Peak." The smaller mountain is called Hyana Piccu, which means "Young Peak," but we shall probably never know the true name of the city buried for so long beneath the Andean jungle.

Windows of the Sun

From the plaza you look up to a wall pierced by three windows—the Windows of the Sun—and if you climb the terraces and up a steep flight of steps you reach one of the most beautiful things in Macchu Piccu—a circular chamber open to the sky and in the centre an arrangement of massive blocks holding a slanting finger of stone. This is Intihuatana, the Hitching Post of the Sun, centuries old, but in design as new as Henry Moore or Barbara Hepworth. Intihuatana is thought to have been a sundial used by the high priest of the sun.

As in the Inca walls, the blocks of the sundial are fitted together with such precision that it is impossible to put a knife blade between them. The towering walls themselves are magnificent. Each block fits its neighbour accurately, even when irregular shapes with many corners are used.

The terraces and courtyards, the circular Temple of the Sun and the steep-roofed houses are things to wonder at, but the city owes much of its beauty to the mountains which surround it. If Macchu Piccu had been built on a plain, archaeologists would still be fascinated by the skill and ingenuity of its builders; but would the unlearned thrill as they do to this city hanging between its attendant peaks and surrounded by the mighty Andes? For me the wonder of Macchu Piccu pales before the wonder of the Andes, huge, terrifying, snow-capped, and carrying masses of wild orchids at their feet.

The air is clear, the sky blue and the sun warm. Lizards dart across the ancient stones; the clothes of the Indians working quietly among the ruins pattern the grass with muted colour. Sometimes a saffron-coloured bird flashes across the valley, but in Macchu Piccu I did not once hear birds singing.

When the last of the visitors has boarded the bus which will wind its way down the road towards the bridge over the Urumbamba and the train which will take them back to Cuzco, the few lucky ones left behind can climb the terraces and the steps to the Hitching Post of the Sun, and without official guides, or chattering crowds intent on filming themselves and their offspring perched on the ancient walls, wait for the Moon Goddess to rise above the lost city of the Incas.

Hyana Piccu—the Young Peak—frowning down on walls whose prehistoric masonry, fitted together with wonderful precision, has defied the passage of time



ABOVE: An Indian girl waits for the train, sitting on the line, her children strapped to her back and spinning a bobbin. BELOW: Hardship has been the lot of this old woman in a "fierce, poverty-stricken land"





Inn at Altdorf, Austria. Photo by J. J. Granville (Plastics Division)